Canon

Service Manual

ENGLISH EDITION

SPEEDLITE

540EZ

(C50-0711, 0712)

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CY8-1200-120

Canon

SPEEDLITE 540EZ

(Meters)	C50-0711
(Feet)	C50-0712

SERVICE MANUAL

Application

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First published October, 1994
Publisher: Osamu Ohkubo (Photo Products Quality Assurance Div.)
Editor (Japanese): Kiminori Igari (Camera Technical Support Department)
Editor (English): Harley Ferguson (Camera Technical Support Department)
Production: ABE Corporation

This manual was produced on an Apple Macintosh™ II ci personal computer and OKI MICROLINE 801PS+F laser beam printer; block copies were printed on Varityper™ 5300 with 4000-J RIP.
A Canon mo-5001S Magneto-Optical Storage Subsystem with mo-502M Magneto-Optical Storage Disk Cartridge and mo-IF2 interface kit were used for storing large volumes of page layout and graphic data for this manual.
Graphics were produced with either Aldus Free Hand™ 3.1 or Adobe Illustrator® 3.2.
All documents and all page layouts were created with QuarkXPress™ 3.1E.

PREFACE

This manual contains information on servicing the product. It has the following sections.

Part 1 General Information

Provides the basic information needed to understand the product.
(Operating instructions are not included. Refer to the products instruction book if necessary.)

Part 2 Technical Information

Provides technical information about the mechanism and electronics of the product.

Part 3 Repair Information

Provides information about the tools and expendables required for disassembly, reassembly, adjustment and measurement of the product, and their locations and method of use.

Part 4 Parts Catalog

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Part 1

General Information

1. FEATURES

1.1 INTRODUCTION

The 540EZ system is a high powered clip-on flash unit with full power GNo = 28 to 54 (at ISO 100•m). Characteristically, this system is a top-class flash unit that features ten new or improved functions based or the desires and opinions of current users of the 430EZ, and that answers user complaints about the 430EZ with regard to operating performance. In particular, this system gives advanced flash photography due to its compatibility with 5-point focusing and 3-point TTL metering when mounted on the EOS-1N.

1.2 FEATURES

■: Newly added feature of 540EZ
❑: Feature functionally improved from 430EZ

❑ 1. Powerful auto zoom flash with full-power GNo.28 - 54 (ISO 100.m)
■ 2. Built-in wide panel provides coverage for 18mm super-wide-angle.
❑ 3. Quick auto zooming covers wide-angle 24 mm to medium-telephoto 105 mm in less than 0.8 sec (at normal temperature)
4. A-TTL auto flash control, TTL auto flash control system
   * When this flash unit is mounted on the EOS-1N, 3-zone auto flash exposure control is coupled to the 5-point focusing.

■ 5. Auto flash confidence lamp verifies exposure immediately after shooting.
■ 6. AF auxiliary light compatible with 5-point focusing is incorporated. (Effective distance-- center; 0.5m to 15m; Outside: 0.7m to 6m)
7. Three types of external power packs are available depending upon market area: . The Laminate Pack E, Transistor Pack E or Compact Battery Pack E.
8. Quick charging with all power sources.
9. Independent flash exposure compensation can be performed in the range of ±3 stops in increments of 1/3 stops, giving a wide range of possibilities.
   * When this system is mounted on the EOS-1N or EOS5, auto flash control exposure level can be compensated from the camera also.

❑ 10. Eight-step (Full to 1/128) manual flash and 1 to 100 Hz / 31-step multi-flash control.
■ * Flashes per burst (1 to 100 / 31 steps) can also be set.
11. Shoe lock (lock pin operated in connection with a clamping ring)
❑ 12. Large, easy to read display using an LCD with built-in uniform electroluminescent illumination.
13. First curtain sync or second curtain sync can be selected.
14. Bounce is possible.
   * Right: 60° to 90° / Left: 60° to 180°/ Upward: 60° - 90° / ■ Downward: 7°
   * Locking at the upward / downward or left/right 0° position and upward 90° position (Lock is released by pressing the relevant unlock button.)

15. Built-in SE function that turns off the power source automatically in 90 sec
■ * The SE function can be cancelled by the main switch.
16. High-level flash lighting can be performed by using multi-flash photographic system accessories.

2. SPECIFICATIONS

1. Model

1.1 Type	Direct-connection contact clip-on type TTL auto exposure flash unit (with AF auxiliary light compatible with 5-point focusing, A-TTL pre-flash, auto zoom, and bounce mechanism)
1.2 Compatible cameras	All EOS series models

2. Guide number

2.1 Normal full power

(ISO 100•meters)

f/(mm)	18	24	28	35	50	70	80	105
GN.	16	28	30	36	42	46	50	54

2.2 Quick firing	The same as manual firing at 1/2 to 1/16 power.
2.3 Manual firing	(ISO 100•m)

f/(mm)		18	24	28	35	50	70	80	105
GN.	1/1	16	28	30	36	42	46	50	54
	1/2	11.3	19.8	21.2	25.5	29.7	32.5	35.4	38.2
	1/4	8	14	15	18	21	23	25	27
	1/8	5.7	9.9	10.6	12.7	14.8	16.3	17.7	19.1
	1/16	4	7	7.5	9	10.5	11.5	12.5	13.5
	1/32	2.8	4.9	5.3	6.4	7.4	8.1	8.8	9.5
	1/64	2	3.5	3.8	4.5	5.3	5.8	6.3	6.8
	1/128	1.4	2.5	2.7	3.2	3.7	4.1	4.4	4.8

3. Number of Flashes / Power Source

Power Source	Flashes (Minimum to Maximum)		
Internal Battery (LR6 Alkaline)	120	to	800
Internal Battery (KR15/51 NiCd)	50	to	350
External Laminated Pack (Japan)	500	to	3,000
External Transistor Pack (LR14 Alkaline)	400	to	2,500
External Transistor Pack (Ni-Cd Pack TP)	350	to	2,000
External Compact BP-E (LR6)	400	to	2,500

The number on the left is the minimum number of flashes in A-TTL mode and number of flashes in manual mode (1/1).The number on the right is the maximum number of flashes in A-TTL mode. All numbers are approximate and based on Canon's test method.

The number of flashes when set to manual 1/2, 1/4, 1/8, 1/16, 1/32, 1/64 or 1/128 becomes respectively about 2,4, 8, 10, 12, 15 and 18 times as large as the number at full power (1/1).

4. Recycle time

Power Source	**Recycle Time (Minimum to Maximum)**	
	Quick Firing Mode	**Normal Mode**
Internal (LR6 Alkaline)	0.2 - 2 sec	0.2 - 13 sec.
Internal y (KR15/51 NiCd)	0.2 - 1.5 sec	0.2 - 7 sec.
Laminated Pack (Japan)	0.2 - 1 sec	0.2 - 3 sec.
Transistor Pack (LR14 Alkaline)	0.2 - 1.5 sec	0.2 - 8 sec.
Transistor Pack (Ni-Cd Pack TP)	0.2 - 1 sec	0.2 - 3 sec.
Compact BP-E (LR6)	0.2 - 1.5 sec	0.2 - 5 sec.

* The left-hand values are the minimum recycle time in A-TTL mode, and the right-hand value are the maximum recycle times in A-TTL and manual (1/1) modes.

5. Flash coverage angle

5.1	Zoom system	By fixed condenser lens and internal zoom system, with built-in wide diffuser panel.
5.2	Zoom methods	(1) Auto zoom Automatically set with the camera SW-1 ON, coupled with the focal length information from the lens. (2) Manual zoom The zoom position is switched in sequence by operating a push switch. (3) Wide diffuser panel When the built-in wide panel is set to MANUAL, the zoom position is automatically set to the 28mm position to cover the angle of view of an 18mm lens.
5.3	Zoom stop positions	Seven positions: 24mm, 28mm, 35mm, 50mm, 70mm, 80mm and 105mm. When set to a bounce position in auto zoom mode 5.2 (1), the zoom position is automatically set to the 50mm position.
5.4	Zooming speed	Approx. 0.8 sec (at normal temperature)
5.5	Setting position display	Digital numeric display on LCD

6. Bounce

6.1 Bounce Angle

Direction	**Range**	**Detent Positions**						
Up	0 to 90°	0°	60°	75°	90°			
Down	0 to 7°	0°	7°					
Left	0 to 180°	0°	60°	75°	90°	120°	150°	180°
Right	0 to 90°	0°	60°	75°	90°			

6.2	Bounce lock	Locks at the upward/downward and left / right at 0° positions, and at the upper 90° position
6.3	Bounce display	When set to a bounce position, the bounce mark is displayed on the display panel.

7. Control system

7.1 Firing modes

(1) Normal firing (pilot lamp: Lights red when flash is ready to fire)

(2) Quick firing (pilot lamp: Lights yellow-green when flash is ready to fire.)

This mode keeps the recycle time at or below 2 seconds.

Both the built-in power source and external power source can be used except in the following conditions.

* Quick firing inhibit conditions

1) When the camera's film transport mode is set to continuous exposure mode.
2) TTL auto flash control mode
* When the camera is set to manual exposure mode
* When using the TTL hot shoe adapter
3) During manual firing at 1/1, 1/2

(3) Multi-firing

The multi-firing function is activated when the X contact is turned ON if the flash is charged, performs multi-firing at the set frequency (1 to 100 Hz), and stops firing when the X contact goes OFF, at the end of the set firing count (1 to 100 times), or when the charge falls below threshold. When this mode is selected, the quantity of light is set to the initial value of 1/16 power, and can be changed by operating the up/down button. However, it cannot be set to 1/1 or 1/2.

1) Usable frequency (31 steps)

1 ~ 20 Hz in 1 Hz steps; 25 ~ 50 Hz in 5 Hz steps; 60 to 100 Hz in 10 Hz steps.

2) Number of Flashes (31 steps)

1 ~ 20 times in 1-step increments; 25 ~ 50 times in 5-step increments, 60 ~ 100 times in 10-step increments

* If the number of flashes is not set, dashes appear on the LCD panel.

Continuous firing starts when the X contact is turned, and is stopped in the following conditions.

a. X contact OFF

b. Insufficient flash charge

c. Absolute firing limitation is reached as shown.

Level	1/4	1/8	1/16	1/32	1/64	1/128
Limit	15	20	50	70	100	160

3) Firing frequency and firing count limitations: At each frequency, a firing count exceeding the values shown in the following table cannot be set.

1/n :Hz	1	2	3	4	5	6	7	8	9	10
1/4	7	6	5	4	4	3	3	3	3	2
1/8	14	14	12	10	8	6	6	5	5	4
1/16	30	30	30	20	20	20	20	10	10	8
1/32	60	60	60	50	50	40	40	30	30	20
1/64	90	90	90	80	80	70	70	60	60	50
1/128	100	100	100	100	100	90	90	80	80	70

1/n :Hz	11	12	13	14	15	16	17	18	19	20
1/4	2	2	2	2	2	2	2	2	2	2
1/8	4	4	4	4	4	4	4	4	4	4
1/16	8	8	8	8	8	8	8	8	8	8
1/32	20	20	20	20	18	18	18	18	18	18
1/64	40	40	40	40	35	35	35	35	35	30
1/128	70	60	60	60	50	50	50	50	50	40

1/n :Hz	25	30	35	40	45	50	60	70	80	90	100
1/4	2	2	2	2	2	2	2	2	2	2	2
1/8	4	4	4	4	4	4	4	4	4	4	4
1/16	8	8	8	8	8	8	8	8	8	8	8
1/32	16	16	16	16	16	16	12	12	12	12	12
1/64	30	30	30	30	30	30	20	20	20	20	20
1/128	40	40	40	40	40	40	40	40	40	40	40

(4) Test flash: Test flash can be performed by the test flash button (which also functions as a pilot lamp).

A-TTL or TTL mode: Full power

Manual or multi-firing mode: Flash output according to the set power setting

* However, test flash is impossible when the camera's metering timer is ON.

7.2 Flash control aperture setting (●: Setting factor)

Camera Exp. Mode	AV set	EOS "Body" Metering	540EZ Preflash
Shutter-priority AE	Auto	●	-
Aperture-priority AE	Manual	-	-
Program AE (full)	Auto	●	●
Manual	Manual	-	-

7.3 Synchronous shutter speed setting (EOS-1N)

Camera Exp. Mode	TV set	X-sync Shutter Speed
Shutter-priority AE	Manual	1/250* sec. or slower
Aperture-priority AE	Automatic	1/250* - 30"
Program AE (full)	Automatic	1/250* - 1/60
Manual	Manual	1/250* sec. or slower - Manual setting

* The maximum synch speed is determined by the EOS body in use.

7.4 Exposure control modes
(1) A-TTL auto flash
(2) TTL auto flash
(3) Manual

7.5 Flash duration control
TTL auto flash control by EOS body control and off-the-film metering

7.6 Flash exposure check
OK: After shooting, the green confidence lamp lights for about 2 seconds.

NG: The confidence lamp does not light.

7.7 Flash exposure compensation

(1) Auto

Daylight fill-in flash and auto reduction control for high brightness controlled by each EOS body.

(2) Manual compensation by operating the 540EZ

Manual compensation in the range of ±3 stops in 1/3-stop increments (When the shooting mode of the camera is not in the full auto mode, the auto flash exposure level is compensated.)

(3) Manual compensation by operating the EOS-1N or EOS5

Electronic dial operation on the body.

* When items (2) and (3) are simultaneously set, item (2) has priority.

7.8 Flash Coupling Range
(1) A-TTL normal firing: 0.5 to 30 m
(2) A-TTL low-voltage firing: 0.5 to 7.5 m (min) to 21 m (max)

7.9 Coupling range display
Display in the LCD panel.

8. Display	
8.1 LCD display	(1) Zoom position (hyphens are displayed when the flash head is in a bounce position.) (2) Manual zoom mark (3) Flash aperture value (4) TTL auto flash mode (A-TTL, TTL) (5) TTL flash coupling range (numeric bar display) (6) Manual firing mode (7) Manual output level (8) Manual correct distance (numeric bar display) (9) Multi-firing mode (10) Multi-firing frequency (Hz) (11) Multi-firing frequency (12) Second curtain sync setting (13) Bounce mark (14) Catch light reflector setting (15) Flash exposure compensation mark (16) Flash exposure compensation value * For the diplays of (5) and (8), the user can select either meters or feet by setting the switch in the battery compartment.
8.2 Charge complete display	(1) Normal charge complete display: The red pilot lamp (LED) comes on. (Full charge - 1 step) (2) Quick charge complete display: The yellowish green pilot lamp (LED) comes on. (Full charge - 4 steps)
8.3 Display unit illumination	Full-surface uniform transmission illumination (yellowish green) for the LCD panel is incorporated. The lamp comes on for 8 seconds when the illumination button is pressed. (When this button is pressed in the lamp ON status, the lamp goes out.)
9. Synchro timing	Either first or second curtain sync can be selected.
10. Flash duration	1.5ms or less
11. Color temperature	Equivalent to daylight.
12. Film speed	ISO 6 to 6400. No setting on flash, controlled by the camera. The flash coupling distance range shifts with the film speed.
13. AF auxiliary light	
13.1 Light source	Ultra-high luminance red LEDs (2 used)
13.2 Pattern	Stripe compatible with 5-point focusing system (center: vertical, left/right: horizontal)
13.3 Effective range	Center 0.5 to 15m; Outer 0.7 to 6m (in low-light)

14.	Power switch	Three-step slide switch: OFF (O mark), ON (I mark) and SE (Save Energy). ON: Always ON without SE. SE: When switch is ON, power is automatically turned off after about 90 seconds idling. As soon as the SE function is activated, the LED goes out (the set mode is stored in memory). The power is turned on again by pressing the shutter button of the camera to the first step or pressing the test flash button. (Compatible with flash photography when using the interval timer function of the Technical Back E.)
15.	Power source	(1) Built-in power source (a) Four AA-size alkaline cells LR6 (AM-3) (b) Four AA-size Ni-Cd cells * Four AA-size lithium cells (FR-6) (2) External power sources (c) AA-size alkaline-manganese cells LR6 (AM-3) × 6 - 9 V (Compact Battery Pack E) (d) Laminated battery (0210 type 315V) (Laminated Pack E315) (e) Battery magazine TP (C-size alkaline cells LR14 (AM-2) × 6 - 9 V) (Transistor Pack E) (f) Ni-Cd pack TP (NR-SC Ni-Cd cells × 6 in sealed pack) (Transistor Pack E)
16.	Connectors	(1) Camera connector 1) Fixed accessory shoe screw lock type with a lock screw tightening coupled lock pin * The lock pin protrudes 1.6mm by the spring force coupled with tightening. 2) Terminals: Direct-coupled 6-pin contact (2) External power connector: Dedicated 3-pin socket.
17.	Dimensions	80 (W) × 138 (H) × 112 (D)mm
18.	Weight	405g (LR6 batteries: +100g)

19. Multi-flash Accessories

When multi-flash accessories are used, some main unit functions are lost. (● : Function normally)

540EZ Function	EOS-1N	
	Off-camera Shoe Cord	TTL Adaptor
A-TTL Auto Flash	●	× (Note 1)
TTL Auto Flash	●	●
Coupling Range Display	●	×
Exposure Confidence Lamp	●	●
540EZ Flash Compensation	●	× (Note 2)
Manual Firing / Power Selection	●	●
Multi-firing / Condition setting	●	●
Second Curtain Sync	●	× (Note 3)
Auto Zoom	●	×
A-TTL IR Pre-flash	●	×
AF Illuminator	●	×
Save Energy with SE selected	●	●

Note 1: When the 540EZ is used in A-TTL mode immediately before multi-flash is used, the display remains without change.

Note 2: In the multi-flash state, the flash exposure compensation value of the 540EZ can be set but it does not function.

Note 3: Though the second curtain sync mark can be set, first curtain sync mode is actually used.

* When using the EOS-1N or EOS5 in the multi-flash photography, flash exposure compensation can be performed by the camera

20. Others

(1) Mode memory

Even if the main switch is turned off, the current control mode and zoom position are stored in memory.

When the battery is replaced in the main switch OFF state, the settings are continuously stored in memory for about 1 minute.

(2) When the 540EZ is used with the EOS-1 or EOS-1N, the aperture value display corresponds automatically to 1/2 step and 1/3 step displays.

(3) When the 540EZ with an EOS 630 or earlier camera, through there is no shoe lock pin fitting hole, the lock pin protrusion is absorbed by the spring and this permits mounting. This relates to 16 (1), 1).

(4) Use of a commercially-available slave unit: Possible

* However, it is recommended to confirm operation in combination with the actual unit.

21. Related products

21.1 New related products	Soft case for 540EZ main unit
21.2 Existing related products	(1) Compact battery pack E main unit (2) Case for compact battery pack E (3) Laminated pack E315 external power supply (4) Connecting cord for laminated pack E315 (5) Case for laminated pack E315 (6) Strap for laminated pack E315 (7) Transistor pack E main unit (8) Connecting cord for transistor pack E (9) Case for transistor pack E (10) Strap for transistor pack E (11) Battery magazine TP for transistor pack E (12) Ni-Cd pack TP for transistor pack E (13) Ni-Cd charger TP for transistor pack E (14) Off-camera shoe cord 2 (15) TTL hot shoe adapter 3 (16) Off-camera shoe adapter (17) TTL distributor (18) Connecting cord 60 (19) Connecting cord 300 *: Not all products listed are available in every market.

22. Supplement (Definitions)

22-1 *New Battery*	LR6 and LR14 alkaline cells and laminated batteries manufactured within 3 months are defined as new. For the Ni-Cd pack TP, a fully-charged (for 15 hours or more) pack is defined as new.
22-2 *Nominal Guide Number*	(1) For measurement, a guide number measuring instrument calibrated by JCII is used. This complies with the JCII standard measurement method. (2) A new battery is used. (3) Immediately after the red pilot lamp comes on, the flash is fired 10 times in sequence. After that, 30 seconds after the red pilot lamp comes on for the 11th time, the measured value of manual full-power flash is specified as the nominal guide number.
22-3 *Nominal Recycling Time*	A new battery is used. After the flash is fired 10 times running as in 22-2 (3), the red pilot lamp comes on for the 11th time. This interval is specified as the nomina recycle time of manual flash firing.
22-4 *Flashes per Battery*	A new battery is used. The flash is fired (1/1 full power) continuously at intervals of 30 seconds. The number of flashes, when the recycle time exceeds 30 seconds, is regarded as the reference value. For A-TTL flash, this value multiplied by 7 is regarded as the nominal maximum number of flashes.

✮ REFERENCE MATERIAL

The maximum flash sync shutter speed and availability of an out-of-coupling-range warning with A-TTL pre-flash for each EOS model is as follows.

Model name	**X-sync shutter speed**				**Existance of A-TTL out-of-coupling-range warning function**
	1/90	**1/125**	**1/200**	**1/250**	
EOS 650		●			●
EOS 620				●	●
EOS 750		●			●
EOS 850		●			●
EOS 630*		●			●
EOS–1				●	●
EOS RT		●			●
EOS 10		●			×
EOS 700		●			×
EOS 1000*	●				×
EOS 100*		●			×
EOS 1000S*	●				×
EOS 5			●		×
EOS Kiss*	●				×

EOS-1N				●	×

* Multiple Model Name List

Japan	**North America**	**Europe & Other**
EOS 630	EOS 630	EOS 600
EOS 1000	EOS REBEL	EOS 1000
EOS 100	EOS ELAN	EOS 100
EOS 1000S	EOS REBEL II	EOS 1000N
EOS KISS	EOS REBEL XS	EOS 500

3. NOMENCLATURE

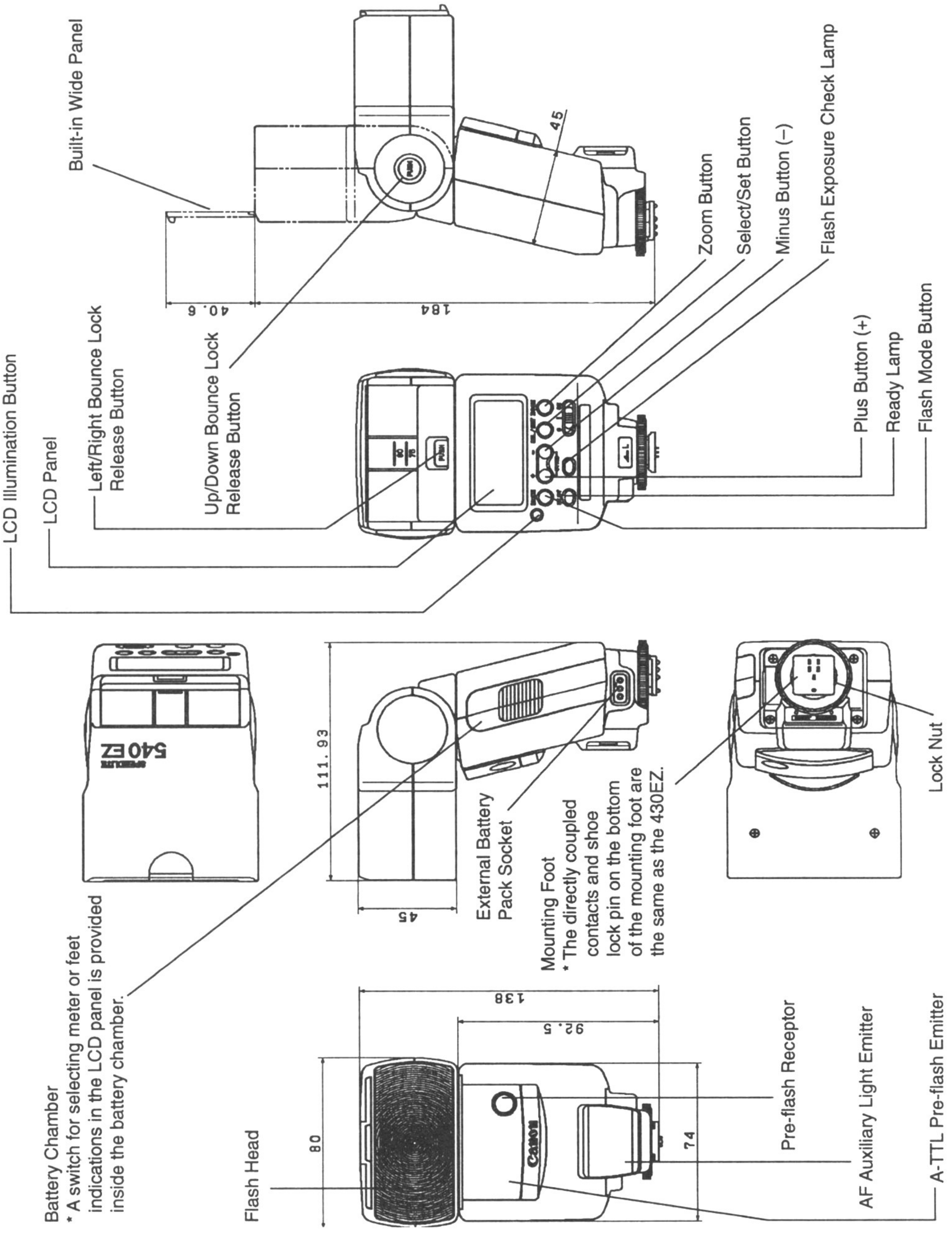
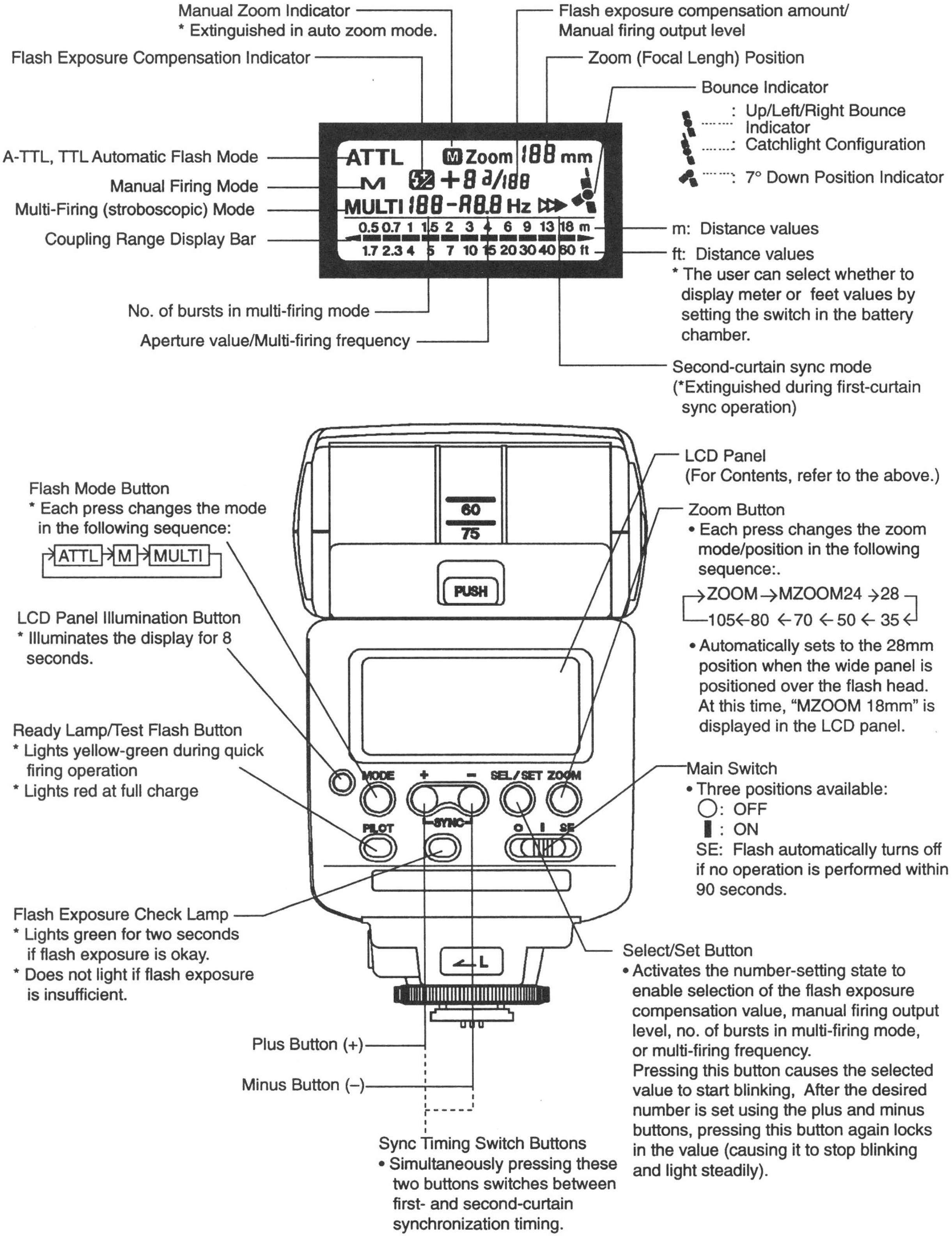

Built-in Wide Panel
LCD Illumination Button
LCD Panel
Left/Right Bounce Lock Release Button
Up/Down Bounce Lock Release Button
Zoom Button
Select/Set Button
Minus Button (–)
Flash Exposure Check Lamp
Plus Button (+)
Ready Lamp
Flash Mode Button
40.6
184
45
111.93
45
External Battery Pack Socket
Mounting Foot
* The directly coupled contacts and shoe lock pin on the bottom of the mounting foot are the same as the 430EZ.
Lock Nut
Battery Chamber
* A switch for selecting meter or feet indications in the LCD panel is provided inside the battery chamber.
540EZ
Flash Head
138
92.5
80
74
Pre-flash Receptor
AF Auxiliary Light Emitter
A-TTL Pre-flash Emitter

Figure 1-1 Nomenclature

4. MAJOR CONTROLS AND INDICATORS



Manual Zoom Indicator
* Extinguished in auto zoom mode.

Flash Exposure Compensation Indicator

Flash exposure compensation amount/ Manual firing output level

Zoom (Focal Lengh) Position

Bounce Indicator
- : Up/Left/Right Bounce Indicator
- : Catchlight Configuration
- : 7° Down Position Indicator

A-TTL, TTL Automatic Flash Mode

Manual Firing Mode

Multi-Firing (stroboscopic) Mode

Coupling Range Display Bar

m: Distance values

ft: Distance values

* The user can select whether to display meter or feet values by setting the switch in the battery chamber.

No. of bursts in multi-firing mode

Aperture value/Multi-firing frequency

Second-curtain sync mode
(*Extinguished during first-curtain sync operation)

Flash Mode Button
* Each press changes the mode in the following sequence:

→ATTL→M→MULTI→

LCD Panel Illumination Button
* Illuminates the display for 8 seconds.

Ready Lamp/Test Flash Button
* Lights yellow-green during quick firing operation
* Lights red at full charge

Flash Exposure Check Lamp
* Lights green for two seconds if flash exposure is okay.
* Does not light if flash exposure is insufficient.

Plus Button (+)

Minus Button (–)

Sync Timing Switch Buttons
- Simultaneously pressing these two buttons switches between first- and second-curtain synchronization timing.

LCD Panel
(For Contents, refer to the above.)

Zoom Button
- Each press changes the zoom mode/position in the following sequence:.

→ZOOM→MZOOM24→28→35→50→70→80→105→

- Automatically sets to the 28mm position when the wide panel is positioned over the flash head. At this time, "MZOOM 18mm" is displayed in the LCD panel.

Main Switch
- Three positions available:

○: OFF
▮ : ON
SE: Flash automatically turns off if no operation is performed within 90 seconds.

Select/Set Button
- Activates the number-setting state to enable selection of the flash exposure compensation value, manual firing output level, no. of bursts in multi-firing mode, or multi-firing frequency.
Pressing this button causes the selected value to start blinking, After the desired number is set using the plus and minus buttons, pressing this button again locks in the value (causing it to stop blinking and light steadily).

Figure 1-2 Major Controls and Indicators

5. PRECAUTIONS

NO.	Precaution/Item	Reason/Remarks
1.	Multi-firing and manual flash operations are not available when the 540EZ is used with the EOS 750, 700 or 850.	Because the flash unit always sees the camera as operating in fully automatic mode. (*Settings are not possible from the 540EZ side.)
2.	Camera display when flash exposure compensation is set on the 540EZ.	The +/- indicator is displayed in the viewfinder (but not in the LCD panel) when using the EOS-1 or EOS-1N. With other EOS models, no indication of flash exposure compensation is provided on the camera.
3.	Conditions in which quick firing is prohibited: ① When shooting continuous exposures with an A-TTL camera ② In TTL automatic flash control mode ③ In manual firing mode with an output level of 1/1 or 1/2	In regards to ①, quick firing is prohibited because the operation of the camera and flash assumes full-power output. Quick firing is prohibited in conditions ② and ③ due to the difficulty in maintaining stable automatic flash exposure control.
4.	The 540EZ's lock nut should be sufficiently loosened before attaching or removing the flash unit to or from the camera.	Though mounting is possible even if the lock pin is protruding slightly, we recommend using the correct method described at the left.
5.	The built-in wide panel should be pulled out gently to avoid damage.	If the wide-panel is accidentally broken off the flash, slide the main switch from OFF to ON while simultaneously pressing the flash mode and zoom buttons. Doing this restores the auto zoom and manual zoom operations to their normal state.
6.	Continuous firing limitations in manual firing mode. 1/1, 1/2 — 15 bursts 1/4, 1/8 — 20 bursts 1/16, 1/32 — 40 bursts 1/64, 1/128 — no limit	These restrictions are implemented to prevent the flash head from damage due to overheating. If the flash is fired continuously for the number of bursts listed at the left, the flash should be rested for approximately 10 minutes to let the flash head cool.
7.	Repeated multi-firing operations should be limited to 10 exposures, after which the flash should be rested for approximately 10 minutes.	This is to prevent the flash head from damage due to overheating.
8.	When using catchlight function with the flash bounced upward at 90°, the shooting distance should not exceed 1.5 m.	Because the amount of reflected light available for producing the catchlight effect is quite small.
9.	The 540EZ's internal batteries are used at all times, even when the flash is connected to an external power source. Accordingly, when the flash is used continuously after loading new batteries in both the flash unit and the external power source, it is possible that the batteries inside the flash unit will become exhausted before those in the external power source. Since the 540EZ will not function correctly if this occurs, the user should always carry spare batteries for the flash unit in addition to the external power source.	To minimize charging time as much as possible, the 540EZ is designed to use power from both the internal batteries and external power source in parallel, regardless of the external power source used. *The above design is also used for the 430EZ when combined with the Compact Battery Pack E. With other external power sources, however, the internal batteries are used only to supply power to the flash unit's control circuits, while the external power source is used only for flash charging.

Part 2

Technical Information

1. TECHNICAL DETAILS

1.1 AF Auxiliary Light Function

1) Configuration

Two high-brightness light-emitting diodes (one for the center focusing point and one for the left and right side focusing points) with a peak wavelength of 695 nm are used for the AF auxiliary light source. The auxiliary light is emitted in the pattern shown in Figure 2-2 according to commands from the camera, and covers all five focusing points for lenses with focal lengths of 24mm or longer. The effective range is approx. 0.5~15 m for the center point, and approx. 0.7~6 m for the side points.

The optical system is configured as illustrated in Figure 2-1, with the optical axis of the AF auxiliary light slanted slightly downward at an angle of 2° relative to the optical axis of the shooting lens (providing a cross-over point with the EOS-1N's optical axis approximately three meters from the camera). Also, part of the AF auxiliary light for the center focusing point is directed downward by a prism plate at an angle of 5.75° (crossing the EOS-1N's optical axis approximately 83 cm from the camera), simultaneously providing AF auxiliary light at the center point for both normal and close-up shooting.

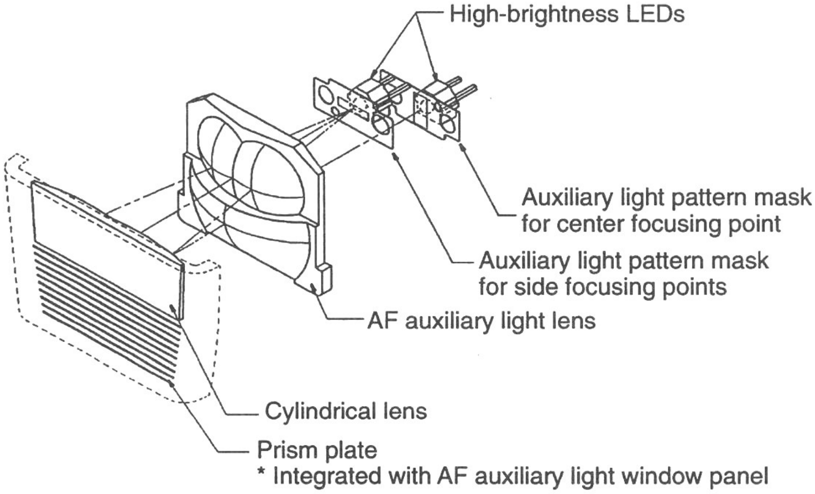

High-brightness LEDs
Auxiliary light pattern mask for center focusing point
Auxiliary light pattern mask for side focusing points
AF auxiliary light lens
Cylindrical lens
Prism plate
* Integrated with AF auxiliary light window panel

Figure 2-1 AF Auxiliary Light Optical System

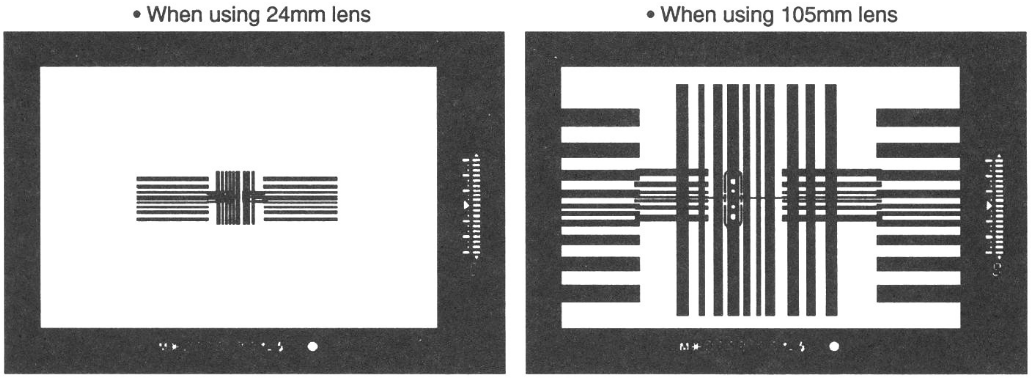

• When using 24mm lens
• When using 105mm lens

Figure 2-2 Viewfinder Field of View and AF Auxiliary Light Pattern

2) AF auxiliary light emission conditions for different EOS cameras

The 540EZ's AF auxiliary light function automatically emits light according to commands from the EOS camera. Depending on the camera model, the emission conditions follow one of the three patterns described below:

(1) When the 540EZ is used with the EOS-1N, the emitted AF auxiliary light corresponds to the five focusing points.

(2) When the 540EZ is used with other EOS models equipped with multiple focusing points (EOS 5, 10, Kiss), the camera's built-in AF auxiliary light function has priority and the 540EZ's AF auxiliary light is not emitted.

(3) When the 540EZ is used with the EOS-1 or other EOS camera with a single, central focusing point, only the center AF auxiliary light is emitted.

3) AF auxiliary light blockage with EF lenses

When the EOS-1N + 540EZ or EOS-1 + 540EZ is used with one of the following five lenses — ① EF200/1.8L, ② EF400/2.8L, ③ EF500/4.5L, ④ EF600/4L, or ⑤ EF1200/5.6L — the AF auxiliary light is blocked by the lens barrel and thus cannot be used.

There is absolutely no problem using the AF auxiliary light with any other lens, even at the closest focusing distance, except for extreme close-up shooting with macro lenses.

1.2 Built-in Wide Panel

1) Use as a wide-angle diffusion panel

The 540EZ features a built-in wide panel that slides out of the way into the top cover of the flash head section when not in use. To use the wide panel, the user simply pulls it out forward all the way and releases it: a built-in spring automatically swings the panel down to cover the front of the flash head.
In this position, a switch inside the panel slide groove automatically detects that the wide panel is in use, and the flash automatically zooms to the 28mm position regardless of whether it is in auto or manual zoom mode. Also, "MZOOM 18" is displayed in the LCD panel to indicate that the flash illumination angle covers the area of a super-wide-angle 18mm lens.
However, there is the possibility that this built-in panel could be damaged by pulling on it with too much force, or by bending it in an unnatural direction. If by chance the panel breaks, the zoom position will be locked at the 28mm position. This can be fixed, however, by turning the main switch OFF and then ON again while simultaneously pressing the flash mode selector button and zoom button. If this is done, the zoom position will be released and both the auto and manual zoom mechanisms will continue to function properly. However, the Wide Panel Segment in the LCD panel will continuously blink to notify the user that the flash unit needs to be repaired.

2) Use as a catchlight panel for bounce flash photography

The wide panel can also be positioned vertically (at a right angle to the face of the flash head) by a locking it at the click stop immediately before the panel is pulled all the way out of its slot.
When the flash is bounced with the panel in this position, part of the light from the flash will be reflected off the back of the panel and bounced directly at the subject, creating a small catchlight in the subject's eyes. This catchlight helps add life to portrait shots.
However, since the strength of the catchlight is quite weak, it is only effective within a range of 1.5 m from the camera. Also, photographs using this catchlight method are assumed to be made with the flash in the 90° upward, frontal bounce position. If the wide panel is left in the catchlight position with the flash head in the standard position or 7° downward position, the entire display panel will blink to warn the user.

* The display will start blinking even if the wide panel is withdrawn from its slot just a few millimeters. If the display starts blinking for no apparent reason, the user should always check the position of the wide panel first to make sure it is fully seated.

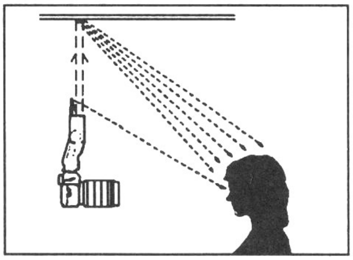


Figure 2-3 Using the Wide Panel in the Catchlight Position

1.3 Pre-flash Operation

The A-TTL mode pre-flash operation of previous EZ series flash units (flash head in standard position: infrared pre-flash; bounce position: visible pre-flash from flash head) was used for (1) setting the flash control aperture in P mode, and (2) triggering the out-of-coupling-range warning when the shooting distance was greater than the throw of the flash in all AE modes. However, due to system rationalization, the "(2) triggering the out-of-coupling-range warning" function has not been included in EOS models released since the beginning of 1990 (refer to page 1-11). The EOS-1N, too, is designed accordingly. As a result, when the EOS-1N is combined with the 430EZ in Tv-AE and Av-AE modes, pre-flash occurs but serves absolutely no purpose.

To avoid this unnecessary waste of energy, the 540EZ is designed to switch to TTL mode and prevent pre-flash when the flash head is not in the standard position or pointed 7° downward in the close-shooting position. The flash coupling distance range at this time can checked by reading the bar graph in the 540EZ's LCD panel (note: the coupling distance range is not displayed when the flash head is in a bounce position).

* This pre-flash prevention function is carried out by the 540EZ. Therefore, even when the 540EZ is combined with EOS bodies other than the EOS-1N, pre-flash is not performed in A-TTL mode when the flash head is moved to a bounce position.

Pre-flash Operation in Each Exposure Mode

Exposure mode	Pre-flash operation	
	540EZ	430EZ
P-AE	●	●
TV-AE	×	●
AV-AE	×	●
M	×	×
Visible pre-flash from flash head in bounce position	×	●

1.4 Post-exposure Flash Exposure Confirmation

In conjunction with the change described above in item 3 (cancellation of pre-flash in A-TTL program mode when flash head is not in standard position), the 540EZ adds a flash exposure confirmation function using a lamp that lights after the picture is taken to indicate that the flash exposure was correct. The lamp lights if the 540EZ's flash emission duration falls within a specified length of time (the determination is made by the 540EZ's control circuitry). If the flash emission is not cut off by the camera within the specified time period, the lamp does not light, indicating that exposure was insufficient.

1.5 Manual Flash Operation

1) Guide number selection and exposure setting

When the 540EZ is set to the M (manual) mode, TTL automatic flash operation is canceled and the flash fires manually. The guide number (output level) in manual mode peaks at full power (1/1), and can be reduced in eight steps to 1/2, 1/4, 1/8, 1/16, 1/32, 1/64 and 1/128 power. When combined with the manual zoom function (including combined use with the wide panel), a total of 64 different guide numbers are available.

The output level can be selected by pressing the "+" and "-" up/down buttons in M mode.

Exposure settings are made by manually selecting the output level and manually setting the lens' aperture. However, when the camera's shutter button is pressed halfway (SW-1 ON), the bar indicator in the 540EZ's LCD panel displays the distance necessary to achieve correct exposure (the flash unit's internal microcomputer automatically calculates the distance for proper exposure by dividing the selected guide number by the set aperture value), allowing the user to carry out the following operations to verify the proper exposure settings:

(1) Autofocus the subject in one-shot AF mode.

(2) With the camera in AF lock mode, check the shooting distance in the lens' distance scale window.

(3) With the camera in AF lock mode, check the shooting distance in the flash unit's LCD panel.

(4) With the camera in AF lock mode, change the aperture or the manual output level until the bar segment closest to the distance value checked in step (2) is displayed in the flash unit's LCD panel.

However, to make sure that accurate exposure is achieved, we recommend using a commercially-available flash meter to determine the optimum aperture value.

2) Manual continuous firing capacity

With the output level set to 1/4~1/128, the 540EZ's continuous shooting capacity when used at high continuous shooting speeds is as shown in the following table:

Power source type		1/4	1/8	1/16	1/32	1/64	1/128
LR6 internal power source		3	5	10	20	40	40
External power source	Compact Battery Pack E	3	6	15	40	40	40
	C-size Battery Pack	3	6	15	40	40	40
	Ni-Cd Pack	4	7	40	40	40	40
	Laminate Pack	4	7	40	40	40	40

* The maximum number of continuous firings is limited to 40 times to prevent the flash head from overheating. After such use, the photographer should let the flash head cool naturally (at room temperature) for at least 10 minutes before reuse.

1.6 Manual Multiple (Stroboscopic) Firing

1) Setting the firing conditions

Whereas the 430EZ is equipped with a stroboscopic firing function providing a selectable multi-firing frequency range of just 1~10 Hz, the 540EZ expands the frequency range to 1~100 Hz. Moreover, the number of firings can be set to "- -" (hyphen display: unlimited number of firings) or from 1 to 100 times.

2) Shutter speed and aperture settings

(1) Shutter speed

When using the 540EZ's multiple flash function, slow shutter speeds are naturally used to achieve the stroboscopic effect. There are two ways to set the shutter speed, as follows:

1. Bulb

   The multiple firings start simultaneously with the start of exposure at SW-2 ON. Then when the firings are completed, the user releases the shutter button to stop the exposure.

2. Setting an appropriate shutter speed

   The appropriate shutter speed is any shutter speed longer than the multiple firing time calculated by dividing the set number of firings by the firing frequency.

   * Example for when no. of firings = 20 and firing frequency = 10 Hz:

   $20 \div 10 = 2$ sec.

   → The user should set a slow shutter speed of 2 seconds or longer.

(2) Aperture

The aperture is set in the same way as during normal manual firing, based on the shooting distance and flash output level.

1.7 Downward Tilt Head

In addition to the upward and left/right bounce capabilities of previous flash units, the 540EZ also provides the capability to tilt the flash head downward at an angle of 7°.

With the head at the standard 0° position, the flash coverage is sufficient for close distances down to 1~1.5 m (the minimum distance differs depending on the lens and zoom setting used), but when taking pictures at even closer distances, the flash illumination falls off at the bottom edge of the picture. For such close-distance shooting situations, even illumination can be obtained by tilting the flash head 7° downward and zooming the flash to the 24mm zoom position or attaching the 18mm wide panel. As a rule, this configuration is appropriate for shooting distances of 0.5~2 m. At distances closer than 0.5 m, since subjects cannot be completely covered by the 540EZ while it is attached to the camera's accessory shoe, we recommend using the Off Camera Shoe Cord E to separate the flash from the camera to properly light the subject.

*Figure 28 on the following page shows the difference in coverage between the standard 0° position and the 7° downward tiling position.

Configuration: EOS-1N + EF28~70mm f/2.8L + 540EZ

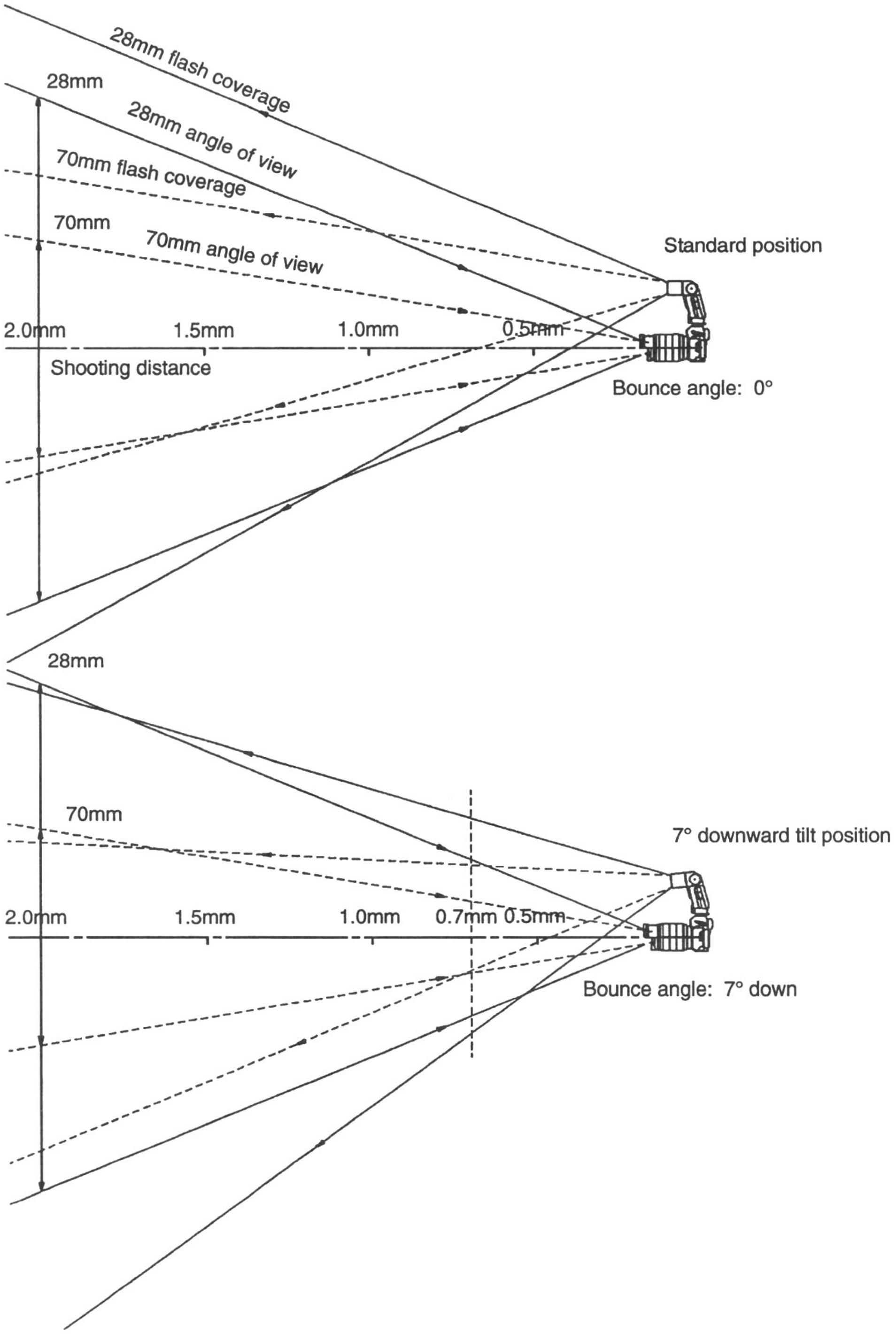

28mm flash coverage
28mm
28mm angle of view
70mm flash coverage
70mm
70mm angle of view
Standard position
2.0mm
1.5mm
1.0mm
0.5mm
Shooting distance
Bounce angle: 0°
28mm
70mm
7° downward tilt position
2.0mm
1.5mm
1.0mm
0.7mm
0.5mm
Bounce angle: 7° down

Figure 2-4 Flash Coverage: Standard and 7° Downward Positions

1.8 Data communications

Data communications between the camera and flash unit are performed through four contacts on the flash foot: (2) EFIDO, (3) CCC, (4) AVEF and (5) STSP. Of these, (2), (4) and (5) are used for simultaneous 8-bit digital communications, and (3) is used to communicate both analog and digital signals. Though the actual data transferred between the camera and flash unit is not provided in this technical information for secrecy reasons, one new communications function has been added so that a camera equipped with 5-point AF can inform the 540EZ whether or not AF auxiliary light operation corresponding to the five focusing points is necessary. Through use of this newly added signal, the 540EZ knows to automatically emit the AF auxiliary light when used with the EOS-1N, but prohibit emission of the AF auxiliary light when used with the EOS 5.
Also, since the EOS-1N allows the user to select the aperture value input pitch and provides a built-in flash exposure compensation function, the status of these functions is communicated to the 540EZ. As a result, the 540EZ can automatically correct the flash coupling distance range display according to changes in the aperture input pitch and/or flash exposure compensation setting.

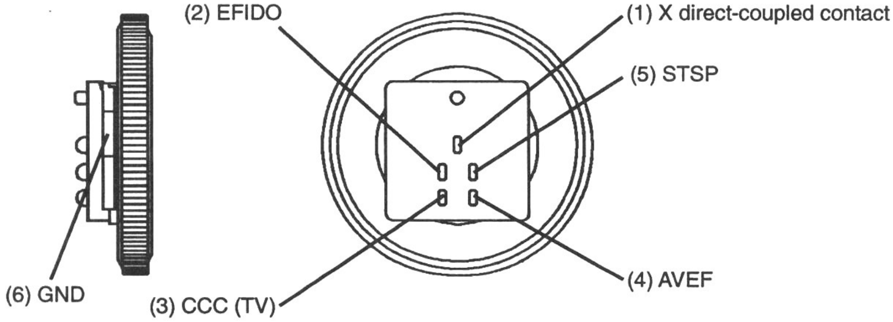


Figure 2-5 Flash Contacts

1.9 Power source system

1) Built-in power source

The standard built-in power source is four AA-size alkaline-manganese LR6 batteries. However, for the first time in a Canon flash unit, AA-size lithium FR6 batteries can also be used. Though the power must be turned off before replacing batteries, the flash unit holds the contents of memory (function settings, etc.) for 90 seconds after the power is turned off. It is therefore recommended to exchange the batteries within this 90 second time period. If more than 90 seconds elapse after turning the power off, the flash returns to its initial default state (A-TTL, flash compensation: 0, auto zoom: 35mm, manual output level: 1/1, multi-flash output level: 1/128, number of firings: - - [no limit], firing frequency: 1 Hz, first-curtain sync).
Also, even when using an external power source, the internal power source is required for the flash control circuitry.

2) External power sources

External power sources developed for the 430EZ can also be used with the 540EZ by connecting them to the 540EZ's external power source terminal. One point of difference between the 540EZ and 430EZ, however, is that whereas the 430EZ is designed to prohibit its quick charging function when connected to an external power source (other than the Compact Battery Pack E power booster) in order to prevent the possibility overheating the flash head during continuous shooting, the 540EZ features an improved design which allows quick charging regardless of the power source. Also, whereas the 430EZ could use its built-in power source in parallel with an external power source only when using the Compact Battery Pack E, the 540EZ is designed to operate this way with all external power sources.

Power source pack	Available batteries
1. Laminate Pack E	One 0210-type 315V laminate battery
2. Transistor Pack E	Six C-size alkaline-manganese batteries Six C-size Ni-Cd batteries Ni-Cd battery pack
3. Compact Battery Pack E	Six AA-size alkaline-manganese batteries Six AA-size Ni-Cd batteries (AA-size lithium batteries cannot be used.)

1.10 Display panel warning indications

(1) Too-close warning in manual firing mode
In manual firing mode, the correct shooting distance is indicated in the display, but if the shooting distance becomes less than 0.5 m, the indicator blinks.

(2) Flash head 7° downward position warning
Since this head position is for use in close-up shooting situations only, the bar segments for 3m and above — and invalid bar segments for 2m and below — blink continuously.

(3) Warning when wide panel is used with the head in an upward or lateral bounce position
Use of the wide panel is not recommended when using bounce flash because there is a possibility of some light from the flash directly illuminating the subject, resulting in an unnatural effect. Accordingly, the entire display blinks to warn the user when the wide panel is left in place when the head is moved from the front-facing position.

(4) Catchlight flash head position warning
The catchlight function is designed to operate with the flash head directed forward and upward at an angle of 90°, with the wide panel positioned vertically as a mini reflector.
If the wide panel is in the catchlight position while the flash head is in the standard or 7° downward position, the entire display blinks to warn the user.

2. COMPATIBLE CAMERAS

2.1 540EZ Functions Available With Each EOS Model

The following table shows the functions available with the 540EZ attached directly to each EOS camera body.

540EZ function		EOS model*														
		1-N	1	5	10	100	Kiss	1000	1000S	630	RT	700	750	850	620	650
A-TTL automatic flash control		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TTL automatic flash control		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TTL automatic flash coupling range display		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flash exposure confirmation indication		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
540EZ-based flash exposure compensation		●	●	●	●	●	●	●	●	●	●	▲	×	×	×	×
Manual firing/output level selection		●	●	●	●	●	●	●	●	●	●	▲	×	×	●	●
Multi-firing/condition setting		●	●	●	●	●	●	●	●	●	●	▲	×	×	●	●
Second-curtain synchronization		●	●	●	●	●	●	●	●	●	●	▲	×	×	●	●
Auto zoom		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manual zoom		●	●	●	●	●	●	●	●	●	●	▲	×	×	●	●
A-TTL infrared pre-flash emission		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AF auxiliary light function	For multiple AF points	●	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	For center point only	×	●	×	×	●	×	●	●	●	●	●	●	●	●	●
X-sync shutter speed		1/250	1/250	1/200	1/125	1/125	1/200	1/90	1/90	1/125	1/125	1/125	1/125	1/125	1/250	1/125
Camera setting for full-automatic flash		P	P	☐	☐	☐	☐	☐	☐	☐	P	×	PROG	PROG	☐	☐
A-TTL out-of-coupling warning range		×	●	×	×	×	×	×	×	●	●	×	●	●	●	●

(●: Functions normally. ×: Does not function. ▲: Functions with certain limitations)

Note 1: The ▲ mark in the EOS 700 column indicates that the function is available only when the dial is set to TV-AE. Full-auto operation is X.

Note 2: When the exposure mode on the camera body is set to Full Auto or a PIC mode, changes to 540EZ functions on the flash unit are not accepted by the camera.

Note 3: With the EOS 5, EOS 1000, EOS 1000S and EOS Kiss, if flash exposure compensation is carried out on the 540EZ while in TTL automatic flash exposure mode, the 540EZ's flash exposure coupling range display is not automatically corrected for the exposure change.

*: See page for model name cross-reference list.

2.2 540EZ Compatibility With Pre-EOS Cameras

In a word, TTL automatic flash operation is possible with the T90, but with other cameras the flash must be used manually using guide number calculations. Supplementary explanations are provided below.

(1) With AE SLRs equipped with a CCC contact on the accessory shoe, the synchronous shutter speed is automatically set upon completion of flash charging.

(2) With the T90, which is equipped with TTL automatic flash control circuitry, both A-TTL and TTL automatic flash exposure are possible.
However, since data communications between the camera and flash differ from the EOS system, operation is restricted as follows:
- Auto zoom, f/No display and coupling range display are not provided on the 540EZ.
- Flash exposure compensation from the flash unit side can be set on the 540EZ, but it does not function.
- Second-curtain synchronization can be set but does not function.

(3) When attached to the T80 and previous cameras which are not equipped with a TTL automatic flash control function, the 540EZ fires at full power because the camera does not send a stop signal to the flash unit.
→ Manually set the aperture according to the value calculated from the "Guide number ÷ Shooting distance" formula.
In manual firing mode, the 540EZ operates at the output level indicated in the display (1/1~1/128).

<MEMO>

3. SWITCHES AND IC

3.1 Names of Switches and Functions

No.	Symbol	Name	Function
1	S1	Test flash switch	Test button for checking flash
2	S2	Bounce switch	Switch for detecting bounce status (vertical, horizontal)
3	S3	7° downward tilt switch	Switch for detecting status of 7° downward tilt
4	S4	FT/M switch	Feet/meter display selector switch
5	S5	Zoom switch	Zoom setting switch
6	S6	EL switch	Light switch for display panel illumination
7	S7	Catchlight switch	Catchlight position setting detection switch
8	S8	Wide panel switch	Wide panel setting detection switch
9	S9	Mode switch	Flash mode selection button
10	S10	Select switch	Flash strength, count, interval selection switch
11	S11	Up switch	
12	S12	Down switch	
13	S13	Zoom position switch	Zoom position detection switch
14	S14	Main switch	Main switch

3.2 IC Functions

No.	Symbol	Function
1	IC-1	Regulator IC: Generates VDD (5V) when battery is turned on, and inputs VDD to IC3 and IC8.
2	IC-3	Voltage detection IC: Outputs the same voltage as the input voltage when input is 3V or more. Voltage becomes 0V when input is less than 3V. Used as reset for IC8 (MPU).
3	IC-5	Regulator IC: Generated the reference voltage for the A/D converter in IC8 (MPU).
4	IC-6	Photosensor control IC: Catches the photosensor output of the flash during manual flash or the reflected light during pre-flash.
5	IC-7	I/F IC
6	IC-8	MPU IC: Overall control
7	IC-9	Zoom motor control IC

4. DESCRIPTION OF CIRCUITS

4.1 Starting up the Power Supply

(1) When the power is turned ON, BATT1 is input to IC1 pin No.4.

(2) IC1 is a step-up regulator IC that outputs a fixed 5V from pin No.5 when there is input to pin No.4. This voltage is input to pin No.2 of IC3 and pin No.81 of IC8 (VDD).

(3) IC3 outputs the same voltage as input if the input to pin No.2 is 3V or more. (Output is 0V if input is less than 3V.)
This voltage is input to the emitter of RQ2.

(4) VDD is supplied to pin No.81 of IC8. When the main switch is turned ON, pin No.13 becomes Low, and this signal is input to RQ2 and RQ14.

(5) By (3) and (4) above, RQ2 turns ON, turning Q5 and Q4 ON, and charging C8.

(6) This top of C8 is a line called Vcc, and is supplied to pin No.60 of IC7, pin No.1 of IC6 and to each of the pins of LED4 as power supply.

(7) When Vcc rises, High is input to the base of Q18 via R1, and Q18 goes ON. When Q18 goes ON, Q2 and Q3 turn ON, and oscillation is started by T1.

* When an external power source is attached the following operations are carried out in addition to the above operations.

(8) RQ9 is simultaneously turned ON during operations in step (4) above. VDD (5V) is then supplied to SEH.

(9) When SEH becomes High, the high voltage circuit in the external power supply operates, and high-voltage is input to HV to charge C15 and C19.

- Flow of Operations: (1) → (2) → (3) → (4) → (5) → (6) → (7)
  ↳ (8) → (9)

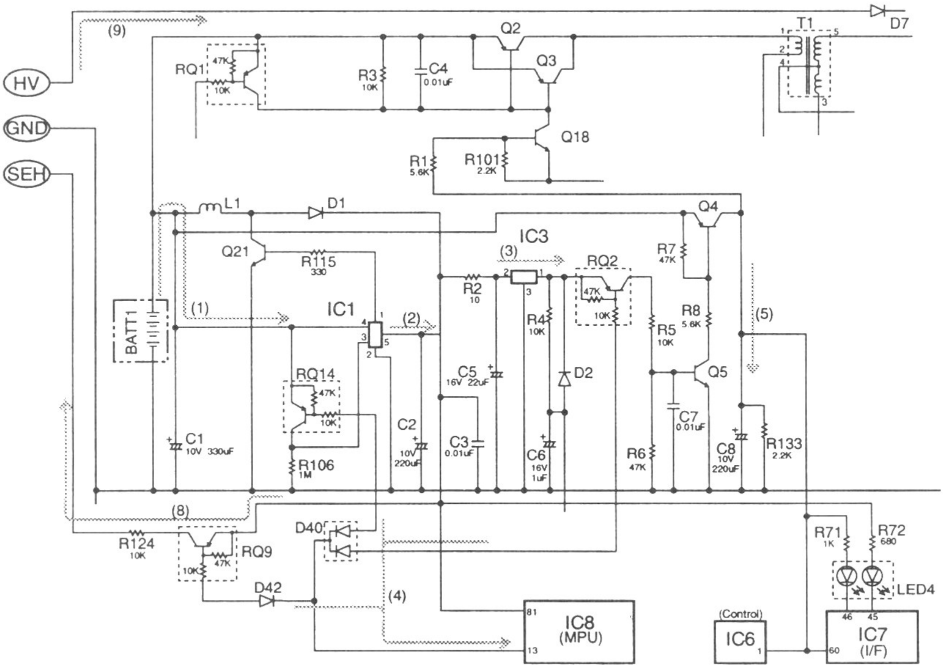

HV
GND
SEH
(9)
RQ1
47K
10K
R3
10K
C4
0.01uF
Q2
Q3
T1
1
2
4
5
3
D7
Q18
R1
5.6K
R101
2.2K
L1
D1
Q21
R115
330
BATT1
(1)
IC1
1
4
3
5
2
(2)
IC3
(3)
2
1
3
R2
10
RQ2
47K
10K
Q4
R7
47K
R8
5.6K
R5
10K
R4
10K
(5)
D2
Q5
C5
16V 22uF
RQ14
47K
10K
C1
10V 330uF
R106
1M
C2
10V
220uF
C3
0.01uF
C6
16V
1uF
R6
47K
C7
0.01uF
C8
10V
220uF
R133
2.2K
(8)
R124
10K
RQ9
10K
47K
D40
D42
(4)
R71
1K
R72
680
LED4
81
IC8
(MPU)
13
(Control)
IC6
1
46
45
IC7
(I/F)
60

Figure 2-6 Circuit 1

4.2 Charging

* The 540EZ uses two-stage charging. The main pre-trigger capacitors (C22, C16) and the initial flash capacitor (C20) are charged first. When these reach 240V or more, the main and pre-flash capacitors (C15, C19) are charged.

(1) When oscillation starts, C22, C16 and C20 (main pre-trigger and initial flash) charge.

(2) At this time, the charge voltages to C22, C16 and C20 are divided by R17, R16, R116 and VR1, and input to pin No.100 of IC8.

(3) When the input to pin No.100 of IC8 of 2.5V or less (charging voltage 240V or less of C22, C16, and C20), pin No.14 of IC8 outputs High, and Q6 turns ON.

(4) In other words, the gate of SCR1 is grounded via D5 and Q6, and SCR1 is OFF, so C15 and C19 do not charge.

(5) Charging of C22, C16 and C20 progresses. When each of their voltages reach 240V or more, and the input to pin No.100 of IC8 is 2.5V or more, pin No.14 of IC8 goes Low, turning Q6 OFF.

(6) Next, SCR1 turns ON, and C15 and C19 are charged.

(7) C22, C16, C20 self-discharge by R16, R17, R116 and VR1 unless the charging voltage to C15 and C19 reach 240V or more.
(This is because the secondary voltage of T1 drops due to the charging to C15 and C19, and charging to C22, C16 and C20 stops.)

(8) Self-discharging of C22, C16 and C20 progresses. When their voltage falls below 240V, and the input to pin No.100 of IC8 falls below 0.6V, pin No.14 of IC8 goes High again.

(9) This stops charging of C15 and C19, and C22, C16 and C20 are charged again.
* By repeating steps (1) to (9), C15 and C19 are charged while the voltages of C22, C16 and C20 are held at 240V.

(10) When both C15 and C19 have reached 240V or more, all capacitors are charged simultaneously.

- Flow of Operations: → (1) → (2) → (3) → (4) → (5) → (6) → (7) → (8) → (9) → (10)
  This cycle is repeated until both reach 240V or more.

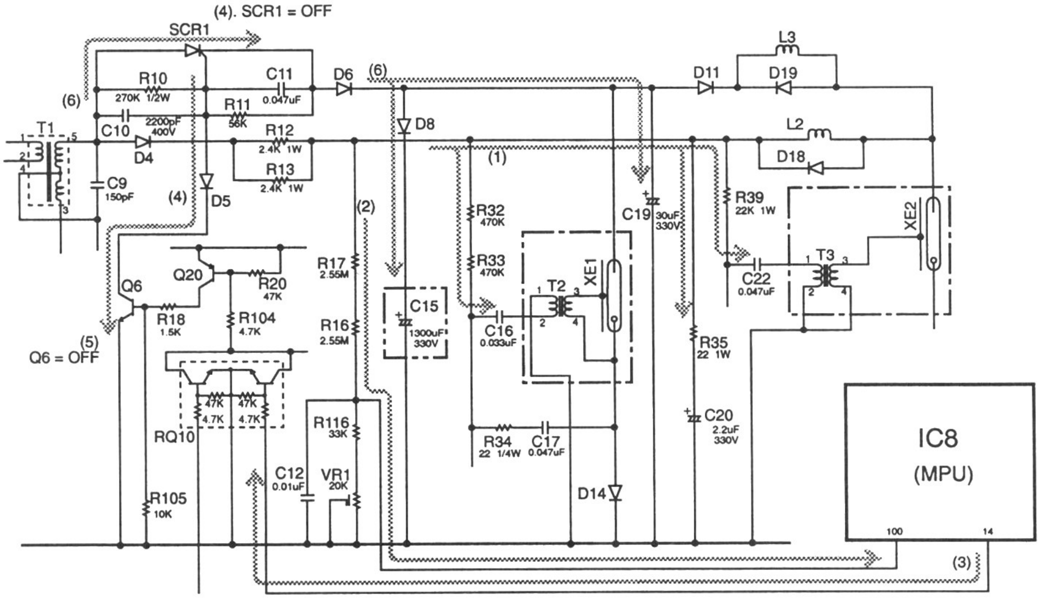

(4). SCR1 = OFF
SCR1
(6)
R10
270K 1/2W
C10
2200pF 400V
D4
T1
C9
150pF
(4)
D5
R11
56K
C11
0.047uF
R12
2.4K 1W
R13
2.4K 1W
D6
(6)
D8
(1)
(2)
R17
2.55M
R16
2.55M
R32
470K
R33
470K
C15
1300uF 330V
C16
0.033uF
T2
XE1
C19
30uF 330V
D11
D19
L3
L2
D18
R39
22K 1W
C22
0.047uF
T3
XE2
R35
22 1W
C20
2.2uF 330V
Q20
R20
47K
Q6
R18
1.5K
R104
4.7K
(5)
Q6 = OFF
47K
47K
4.7K
4.7K
RQ10
R105
10K
R116
33K
C12
0.01uF
VR1
20K
R34
22 1/4W
C17
0.047uF
D14
IC8
(MPU)
100
14
(3)

Figure 2-7 Circuit 2

4.3 Charge Completion Indicator

- Pilot lamp lighting voltage

The following table shows the pilot lamp (LED1) lighting voltages according to the flash mode.

Flash Mode	Pilot Lamp (LED1) Lighting Voltage [V]	
	Green	Red
ATTL, M1/16, M1/32, M1/64, M1/128	125 V (0.96 V)	265 V (2 V)
M1/4, M1/8	195 V (1.44V)	265 V (2 V)
M1/1, M1/2 When external power supply is used MULTI (1 Hz ~ 100 Hz)	—	265 V (2 V)

(1) The charge (voltage) to C15 (for main flash) is divided at R28 and VR2 via D8, and is input to pin No.40 of IC7.

(2) When this input voltage is a fixed voltage or more, pins No.45 (green) and No.46 (red) of IC7 each become Low according to this voltage, and the green or red lamp of the pilot lamp LED1 light to indicate that charging is completed.

- Flow of Operation: (1) → (2)

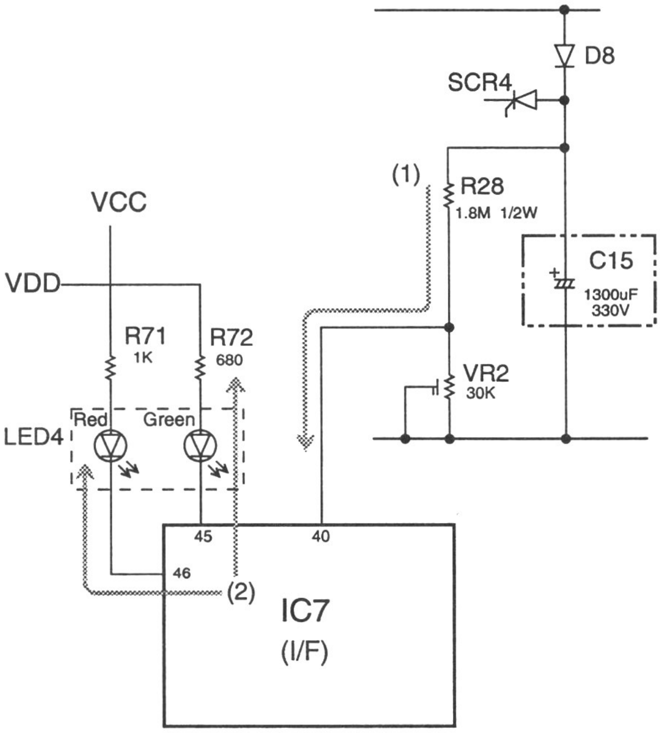

D8
SCR4
(1)
R28
1.8M 1/2W
C15
1300uF
330V
VCC
VDD
R71
1K
R72
680
VR2
30K
Red
Green
LED4
45
40
46
(2)
IC7
(I/F)

Figure 2-8 Circuit 3

4.4 Determining Pre-flash and Aperture (A-TTL mode)

* In the ATTL mode, the *f*/stop computed based on the light reflected from the subject by pre-flash (infra-red light) and the *f*/stop computed by the camera are compared to determine the appropriate *f*/stop. There is no pre-flash during bounce flash.

(1) When SW-1 on the camera is pressed, the TV signal is input to pin No.6 of IC7.

(2) At the same time, the EFID signal indicating the camera mode is input to pin No.9 of IC7 from the camera.

* If the camera is in the ATTL mode, pre-flash described below is carried out. In other modes, pre-flash is not carried out.

(3) First of all, the trigger signal (High) for pre-flash is output from pin No.37 of IC7.

(4) When this signal is input to the gate of SCR2, SCR2 turns ON, and C16 (for pre-trigger) starts to discharge.

(5) At this time, the voltage raised by T2 is applied to XE1, and pre-flash is carried out by the load of C19 (for pre-flash).

(6) The light reflected from the subject by pre-flash is input to PD2, and is relayed from pin No.8 of IC6 to pin No.55 of IC7.

(7) IC7 outputs distance information to the camera from pin No.7 (AVEF line) based on this information. (At the camera, the aperture (AV) is determined based on this information taking existing light, ISO, mode and other factors into consideration.)

(8) The aperture (AV) determined at the camera is relayed to pin No.9 of IC7 by the EFID line to determine the *f*/stop.

* Signals on the AVEF line are relayed to EOS series cameras as digital signals, and to the T-90 as analog signals. Judgment of EOS and T-90 is carried out according to the terminal voltage of EFID. If the voltage is 2.2V or more, the camera is judged to be an EOS series camera.)

- Flow of Operation: (1) → (2) → (3) → (4) → (5) → (6) → (7) → (8)

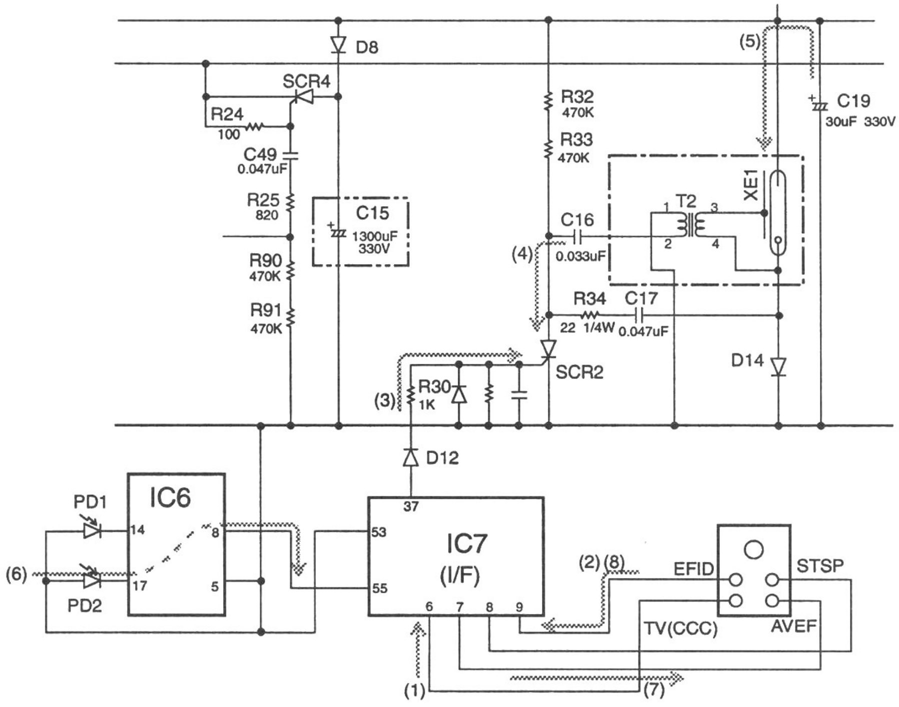

D8
(5)
SCR4
R24
100
C49
0.047uF
R25
820
C15
1300uF
330V
R90
470K
R91
470K
R32
470K
R33
470K
C19
30uF 330V
XE1
T2
1
3
2
4
C16
0.033uF
(4)
R34
C17
22 1/4W
0.047uF
SCR2
D14
(3)
R30
1K
D12
PD1
IC6
14
8
17
5
(6)
PD2
37
IC7
(I/F)
53
55
6
7
8
9
(2),(8)
EFID
STSP
TV(CCC)
AVEF
(1)
(7)

Figure 2-9 Circuit 4

4.5 Main Flash

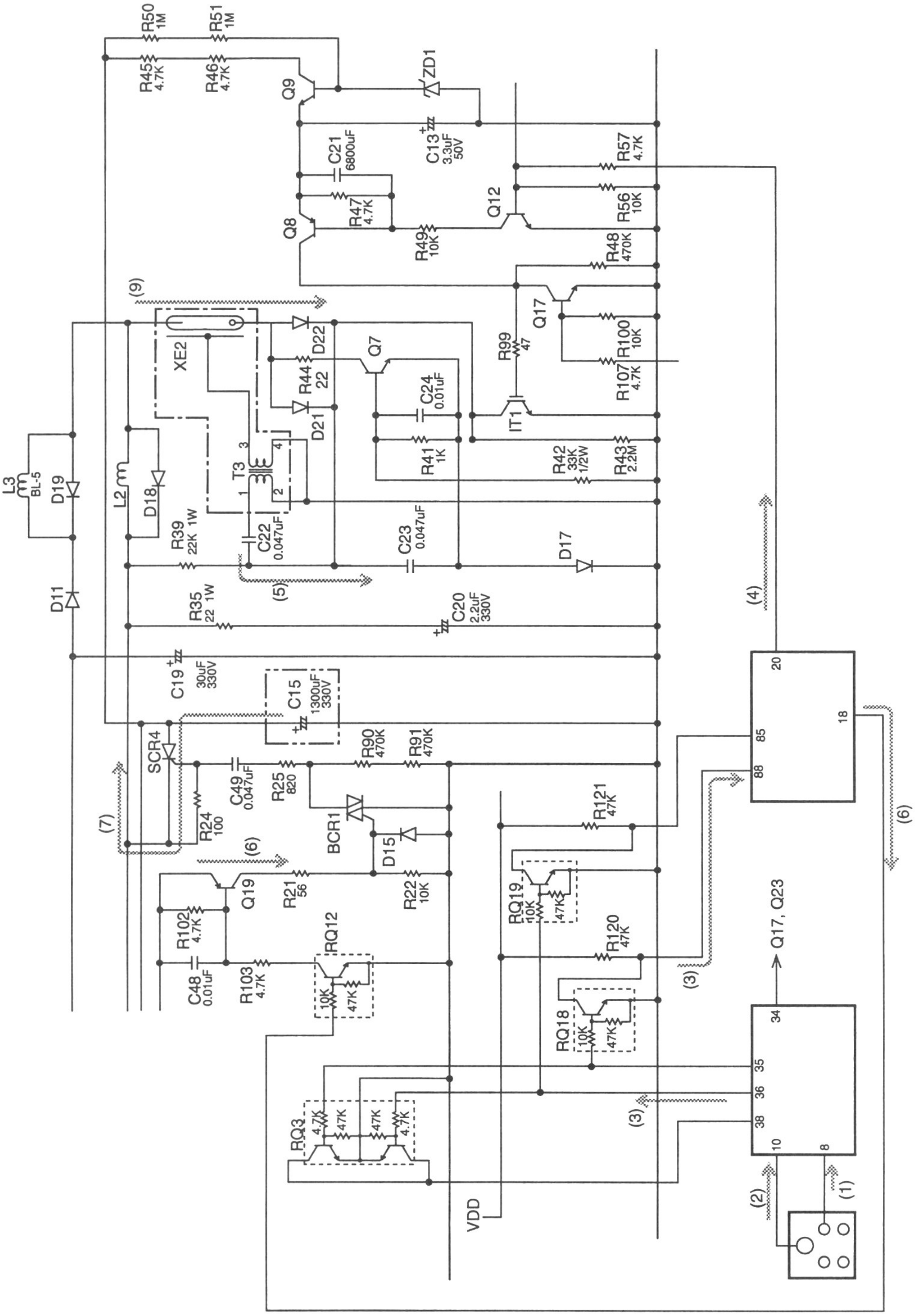

R50 1M
R51 1M
R45 4.7K
R46 4.7K
Q9
ZD1
C21 6800uF
C13 3.3uF 50V
R57 4.7K
Q8
R47 4.7K
R49 10K
Q12
R56 10K
R48 470K
(9)
Q17
XE2
D22
Q7
R44 22
R99 47
R100 10K
C24 0.01uF
R107 4.7K
IT1
L3 BL-5
D19
L2
D18
T3
D21
R41 1K
R42 33K 1/2W
R43 2.2M
R39 22K 1W
C22 0.047uF
C23 0.047uF
D17
D11
(5)
R35 22 1W
C20 2.2uF 330V
(4)
C19 30uF 330V
C15 1300uF 330V
SCR4
C49 0.047uF
R25 820
R90 470K
R91 470K
20
85
88
18
(7)
R24 100
(6)
BCR1
D15
R121 47K
Q19
R21 56
R22 10K
RQ19 10K 47K
(6)
R102 4.7K
C48 0.01uF
R103 4.7K
RQ12 10K 47K
R120 47K
(3)
Q17, Q23
RQ18 10K 47K
34
35
36
38
10
8
RQ3 4.7K 47K 47K 4.7K
(3)
VDD
(2)
(1)

Figure 2-10 Circuit 5

(1) When the shutter is released, the STSP signal is input to pin No.8 of IC7 from the camera.
(2) When the shutter is fully open, the X signal is input to pin No.10 of IC7 from the camera.
(3) A High signal (initial flash trigger) is output from pin No.35 of IC7 by executing an AND operation on these STSP and X signals, and is input to pin No.88 of IC8 via RQ18. A High signal (main flash trigger) is also output slightly delayed from pin No.36 of IC7, and is input to pin No.85 of IC8 via RQ19.
(4) A High signal is output from pin No.20 of IC8 by input to pin No.88 of IC8. Turning ON of Q12 turns Q8 ON, and IT1 turns ON.
(5) When IT1 goes ON, C22 discharges. The trigger is generated by T3, and XE2 flashes initially.
(6) Next, a High signal is output from pin No.18 of IC8 by input to pin No.85 of IC8. Turning ON of RQ12 turns Q19 ON, turning BCR1 ON.
(7) With BCR1 ON, the charge stored to C49 is discharged in the loop C49(+) → R24 → L2 → XE2 → IT1 → C49(-).
(At this time, XE2 is at a resistance of several Ohms due to initial flashing.)
(8) By this current, High is input to the gate of SCR4, and SCR4 becomes ON.
(9) When SCR4 goes ON, the change of main capacitor (C15) flows to XE2 via L2, and main flash fires.

* The reason for initial flash being carried out before the main flash is in order to smooth flash startup and to improve flash control precision.

- Flow of Operation: (1) → (2) → (3) → (4) → (5) → (6) → (7) → (8) → (9)

4.6 Flash Control

(1) Reflected light from the subject is input to the SPD of the camera by the main flash.

(2) When the camera judges that this reflected light provides a sufficient exposure intensity, the STSP (flash stop signal) signal state changes from Low to High.

(3) When the No.8 pin of IC7 receives this signal, High is output to pin No.34 of IC7, and is input to the base of Q17 and Q23.

(4) The High signal to pin No.34 of IC7 is input to pin No.90 of IC8 via RQ17, and High is output from pin No.19 of IC8.

(5) Operations in steps (3) and (4) turn Q17 and Q23 ON. Turning ON of Q23 turns Q12 ON and turns Q8 OFF.

(6) This turns IT1 OFF to stop flashing.

* Checking the Results of Light Adjustment

(7) If a High input is received by pin No.90 of IC8 within 3.4ms of pin No.88 of IC8 receiving the TRIG signal (IC7 pin No.35 output High signal), the High signal is output for two seconds from pin No.22 of IC8.

(8) The High signal from pin No.22 of IC8 turns RQ6 ON to light LD1.

- Flow of Operation: (2) → (3) → (5) → (6) → (7) → (8)
  → (4)

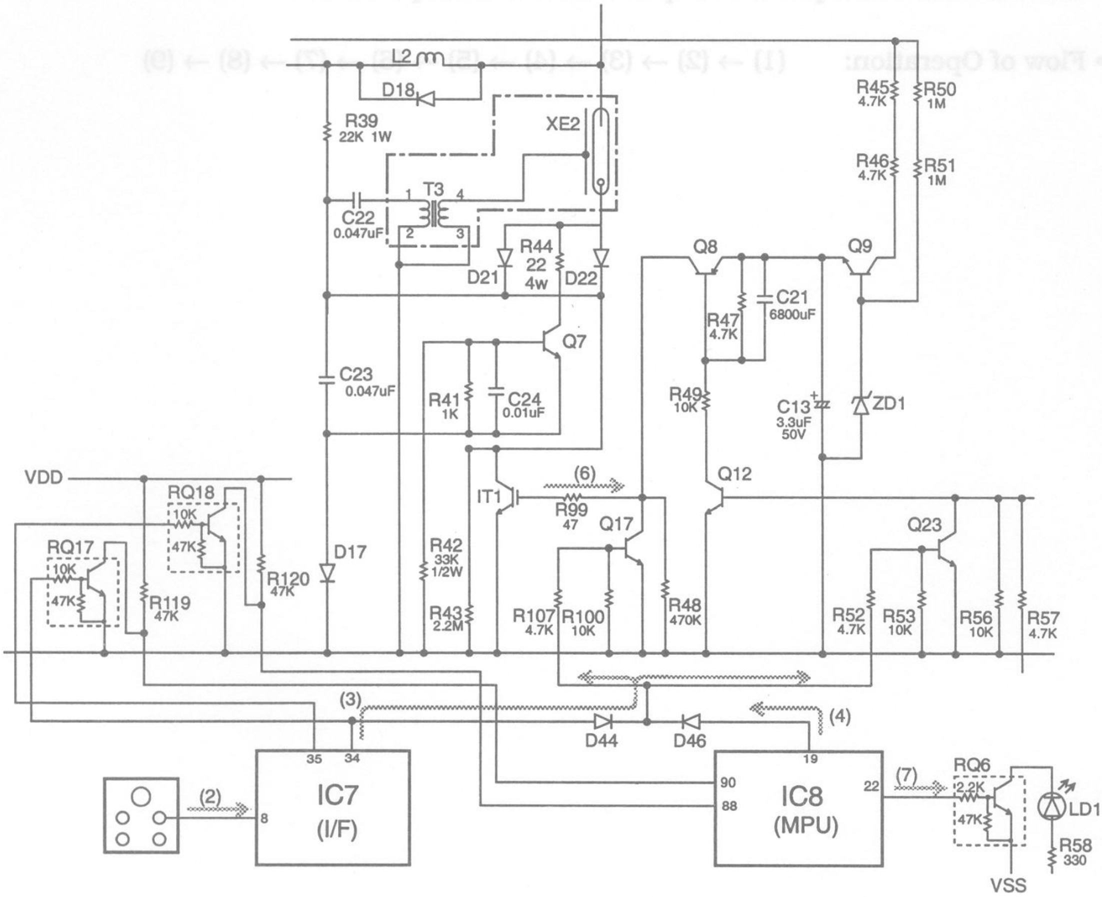

L2
D18
R39 22K 1W
XE2
T3
C22 0.047uF
R44 22 4w
D21
D22
R45 4.7K
R50 1M
R46 4.7K
R51 1M
Q8
Q9
C21 6800uF
R47 4.7K
Q7
C23 0.047uF
R41 1K
C24 0.01uF
R49 10K
C13 3.3uF 50V
ZD1
VDD
RQ18 10K 47K
RQ17 10K 47K
IT1
(6)
R99 47
Q17
Q12
Q23
D17
R42 33K 1/2W
R120 47K
R119 47K
R43 2.2M
R107 4.7K
R100 10K
R48 470K
R52 4.7K
R53 10K
R56 10K
R57 4.7K
(3)
D44
D46
(4)
35
34
19
(2)
8
IC7 (I/F)
90
88
IC8 (MPU)
22
(7)
RQ6 2.2K 47K
LD1
R58 330
VSS

Figure 2-11 Circuit 6

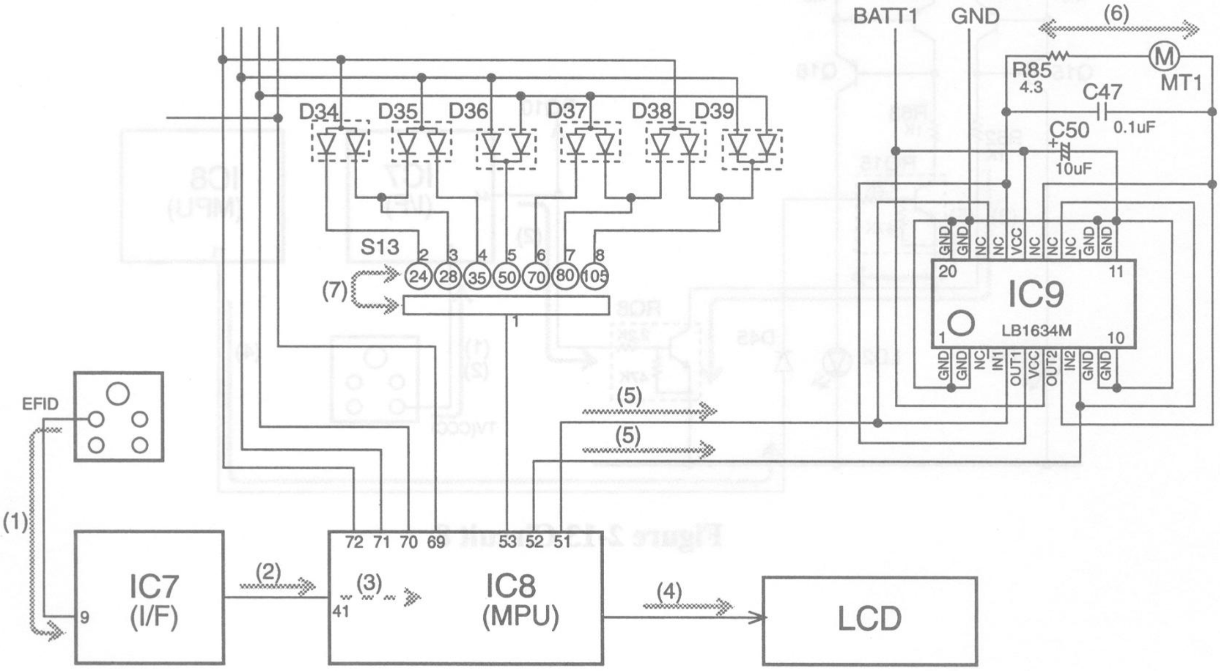
4.7 Auto Zoom

(1) When camera's SW1 is turned on, the focal length information is input to the flash unit (pin No.9 of IC7) on the EFID line from the camera.
(2) IC7 relays this information to pin No.72 of IC8 from pin No.26.
(3) By this, IC8 internally judges whether or not auto zoom is needed.
(4) When the focal length information has been changed, a signal is sent to the LCD display from IC8, and the new focal length is displayed.
(5) To adjust the flash coverage angle, a High signal (dependent on the zoom direction) is input from one of pins No. 51 or 52 of IC8.
(6) When this signal is input to either of pins No.4 or No.8 of IC9, pins No.15 and 17 of IC9 become High and Low, respectively, the motor rotates (changes depending on the direction of zoom), and the internal flash head unit moves.
(7) This movement status is input to pins No.69 to 72 of IC8 by the zoom detection switch.
(8) Motor rotation continues until the focal length information from the lens matches the zoom detection switch information in order to set the correct flash coverage angle.

Note: During motor rotation, the signal from pin No.14 of IC8 is input to RQ10 in order to inhibit charging of the main capacitors. (For details, see 4.9 Charge Inhibit.)

* When using bounce flash, the flash coverage angle is automatically set to the 50mm focal length (controlled by MPU).

- Flow of Operation: (1) → (2) → (3) → (4) ┬→ (5) → (6) → (7)
  └→ Charging inhibited



BATT1
GND
(6)
R85
4.3
M
MT1
C47
0.1uF
C50
10uF
D34
D35
D36
D37
D38
D39
S13
2 3 4 5 6 7 8
24 28 35 50 70 80 105
1
(7)
GND GND NC NC VCC NC NC NC GND GND
20
11
IC9
LB1634M
1
10
GND GND NC IN1 OUT1 VCC OUT2 IN2 GND GND
(5)
(5)
EFID
(1)
9
IC7
(I/F)
(2)
72 71 70 69
53 52 51
(3)
41
IC8
(MPU)
(4)
LCD

Figure 2-12 Circuit 7

4.8 AF Auxiliary Light

* When AF cannot be detected because the brightness of the subject is below a fixed value, the red AF LED lights according to the following procedure.

(1) When the camera judges that additional light for focusing is required, a High signal of about 5V is generated on the TV line. (This is a pulsed signals. Generation of this signal is repeated up to 10 times until detection of AF.)

(2) When pin No.6 of IC7 receives this signal, High is output to pin No.44 of IC7.

(3) This turns RQ8, Q13 and Q15 ON, and AF-LED (LD3) lights.
(Q13 is for stabilizing the current flowing to the LED.)

Note: The High signal to pin No.44 of IC7 is also input to RQ10 to inhibit the main capacitor being charged during lighting of the AF-LED. (For details, see 4.9 Charge Inhibit.)

(4) When the camera communicates the instruction to light LED3, High is output from pin No.11 of IC8.

(5) This turns RQ15, Q14 and Q16 ON via D45. If RQ8 is ON, AF-LED (LD2) lights.
(Q14 is for stabilizing the current flowing to the LED.)

- Flow of Operation:
  (1) → (2) → (3) → LD3 lights
  (3) → (4) → (5) → LD2 lights

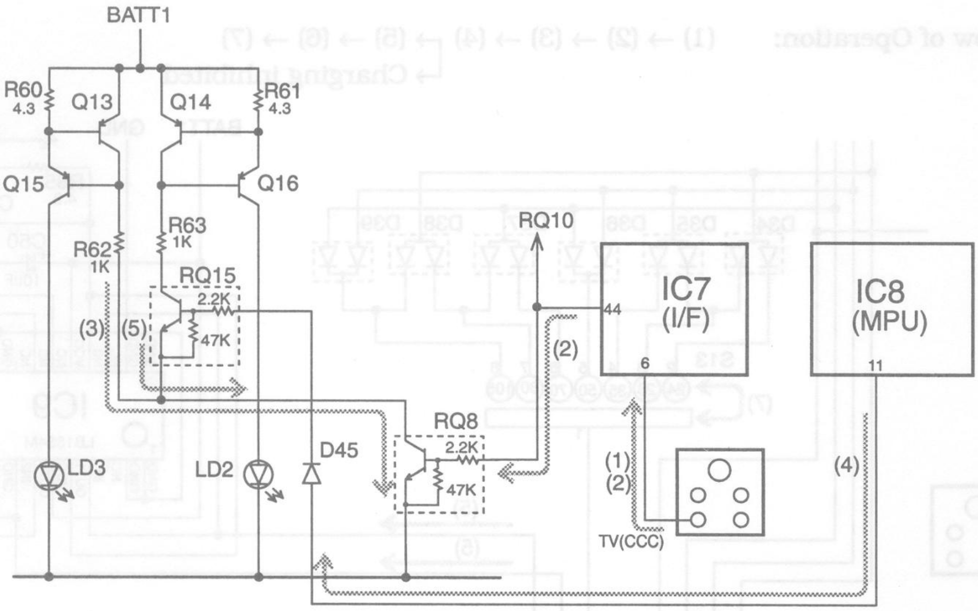


Figure 2-13 Circuit 8

4.9 Charge Inhibit

* In order to prevent malfunction due to a sudden drop in battery voltage caused by an excessive load being placed on the battery during operation of the zoom motor and lighting of the AF-LED, charging of the main flash capacitor (C15) is temporarily inhibited by the following procedure.

(1) A High signal is input to RQ10 from pin No.14 of IC8 during operation of the zoom motor.

(2) Likewise, a High signal is input to RQ10 from pin No.44 of IC7 during lighting of the AF-LED.

(3) When the above High signals are input to RQ10, RQ10 and Q20 turn ON.

(4) Accordingly, Q6 goes ON, and SCR1 goes OFF. In other words, charging of the capacitor for main flash (C15) is temporarily inhibited, thus preventing malfunction due to a sudden drop in power.

- Flow of Operation:

  - During zoom motor operation (1) ┐
  - While AF LED is lit (2) ┘→ (3) → (4)

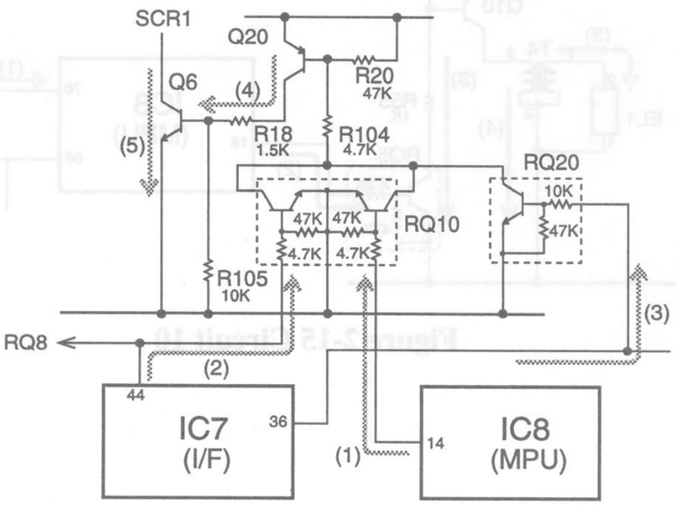

SCR1
Q20
Q6
(4)
R20
47K
(5)
R18
1.5K
R104
4.7K
RQ20
10K
47K
47K
47K
RQ10
4.7K
4.7K
R105
10K
(3)
RQ8
(2)
44
IC7
(I/F)
36
(1)
14
IC8
(MPU)

Figure 2-14 Circuit 9

4.10 Panel Illumination (EL) Lighting

(1) If you press the EL-SW switch on the rear of the control panel, the signal from EL-SW is input to pin No.70 of IC8.

(2) This repeatedly outputs a pulsed High signal to pin No.16 of IC8. (approx. 4.6 KHz, output for approx. 8 seconds after operating EL-SW)

(3) When the High signal is input to the base of RQ5, RQ5, Q10 and Q11 turn ON.

(4) When the base of RQ5 goes Low at the rise of the next pulse, RQ5, Q10, and Q11 turn OFF.

(5) By repeating the operations in steps (3) and (4) above, a high-voltage pulse (approx. 70V) raised by T4 is applied to EL1, causing it to light.

- Flow of Operation: (1) → (2) → (3) / → (4) → (5)

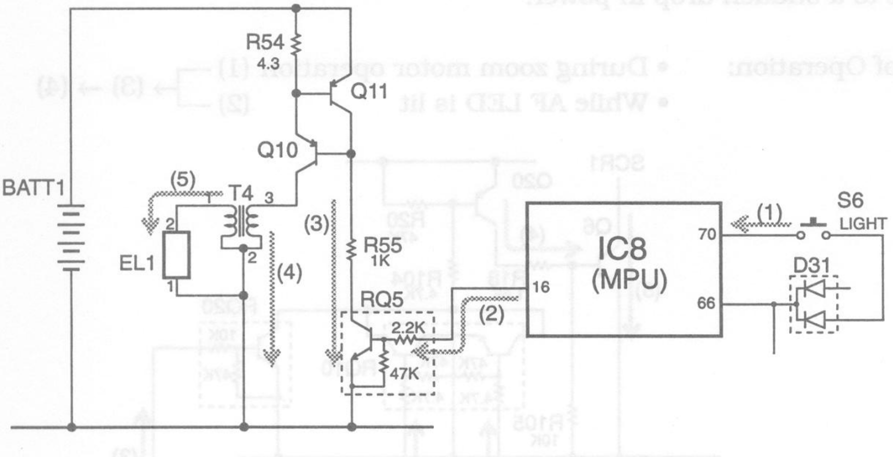

R54
4.3
Q11
Q10
BATT1
(5)
T4
3
2
2
1
EL1
(3)
(4)
R55
1K
RQ5
2.2K
47K
(2)
16
IC8
(MPU)
70
66
(1)
S6
LIGHT
D31

Figure 2-15 Circuit 10

4.11 SE Timer

(1) If a non-operating state continues for about 90 seconds after turning the main switch ON, the state of pin No.13 of IC8 changes from Low to High, and RQ14 goes OFF. Likewise, RQ9 and RQ2 go OFF, stopping supply of VCC. This turns Q18 OFF to stop oscillation.

(2) Restart is carried out by pressing the test button, or pin No.29 of IC7 becoming Low due to the signal (High signal on TV line) from the camera.

(3) This signal changes the state of pin No.87 of IC8 to Low.

(4) This changes the state of pin No.13 of IC8 from High to Low, and restarts oscillation.

- Flow of Operation: (1) → (2) → (3) → (4)

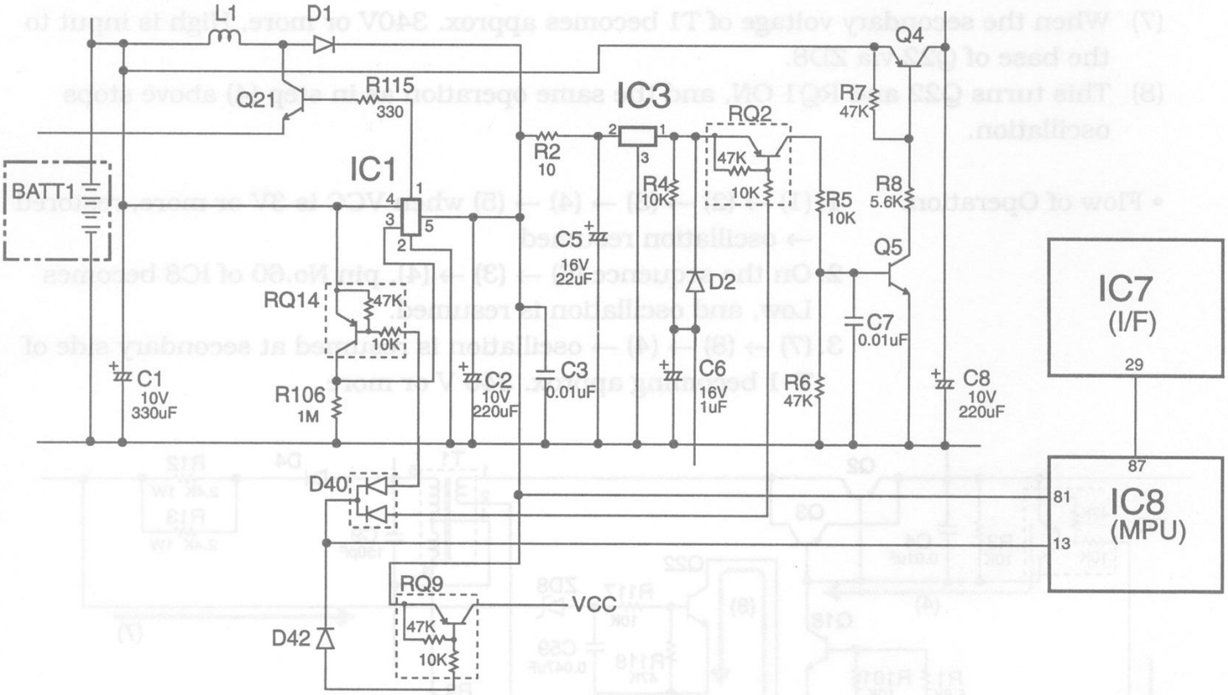

L1
D1
Q4
Q21
R115
330
IC3
R7
47K
RQ2
R2
10
47K
10K
R4
10K
R5
10K
R8
5.6K
BATT1
IC1
4
1
3
5
2
C5
16V
22uF
D2
Q5
IC7
(I/F)
RQ14
47K
10K
C7
0.01uF
29
C1
10V
330uF
R106
1M
C2
10V
220uF
C3
0.01uF
C6
16V
1uF
R6
47K
C8
10V
220uF
87
D40
81
IC8
(MPU)
13
RQ9
VCC
47K
10K
D42

Figure 2-16 Circuit 11

4.12 Temporary Mode Memorization

The set flash mode is memorized for 90 seconds even if the batteries are replaced with the main switch turned OFF (or, in the SE mode). The following describes circuit operation at this time.
(See Figure 2-16 for details on the circuit diagram.)

(1) As pin No.13 of IC8 is High when the main switch is OFF, or when the camera is in the SE mode, RQ2, RQ9 and RQ14 are OFF. VDD output from pin No.5 of IC1 is not supplied to the flash control circuit, and is supplied only to pin No.81 of IC8.

(2) If the batteries are removed at this time, the energy of C2 is supplied to IC8 as VDD, and the flash mode is held in memory for about 90 seconds, or the time that energy from C2 continues.

4.13 Oscillation Interruption

(1) The voltage level of VCC is monitored by pin No.33 of IC7.
(If this voltage falls below 3V, the following operations are carried out in order to prevent malfunction due to the drop in VCC voltage.)

(2) When Vcc falls below 3V, pin No.43 of IC7 becomes High.

(3) This turns RQ13 and RQ1 ON.

(4) When RQ1 turns ON, Q2 and Q3 go OFF to stop oscillation.

(5) When the voltage of Vcc returns to 3V or more, pin No.43 of IC7 goes Low again to resume oscillation.

(6) In order to to stabilize operation (in particular, flash level control) immediately after the main flash, pin No.60 of IC8 becomes momentarily High at the same time as the main flash to interrupt oscillation by the same operation as above. (This is because the fluctuations in the VCC level influence the flash control level.)

(7) When the secondary voltage of T1 becomes approx. 340V or more, High is input to the base of Q22 via ZD8.

(8) This turns Q22 and RQ1 ON, and the same operation as in step (4) above stops oscillation.

- Flow of Operation:

1. (1) → (2) → (3) → (4) → (5) when VCC is 3V or more, restored → oscillation resumed
2. On the sequence (6) → (3) → (4), pin No.60 of IC8 becomes Low, and oscillation is resumed.
3. (7) → (8) → (4) → oscillation is resumed at secondary side of T-1 becoming approx. 340 V or more.

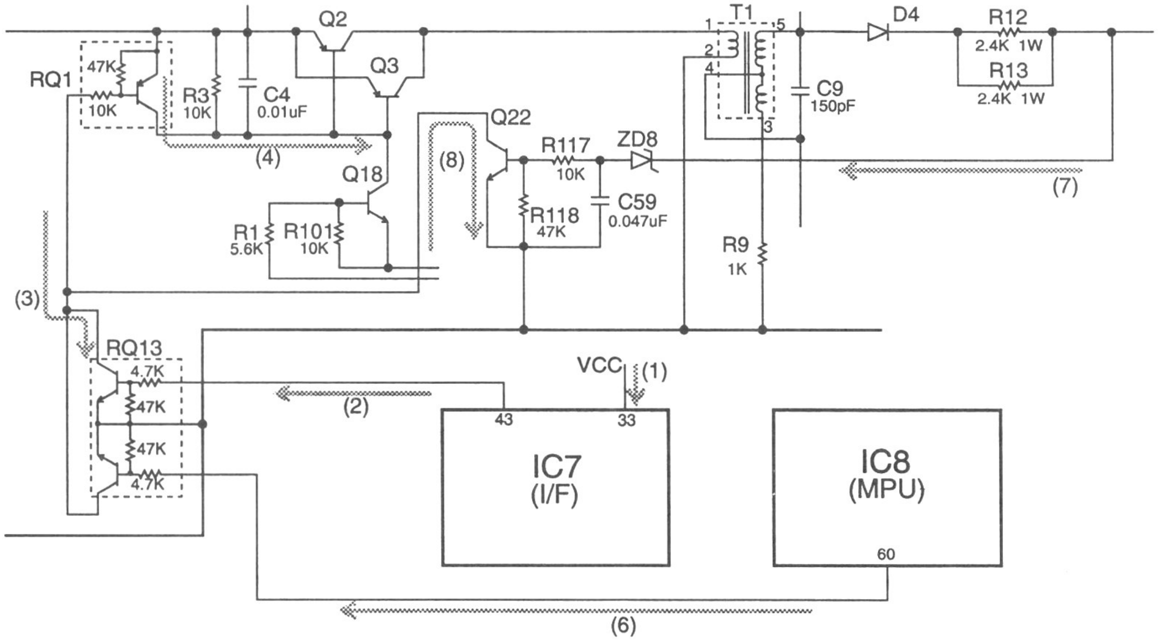

RQ1
47K
10K
R3
10K
C4
0.01uF
Q2
Q3
(4)
Q18
R1
5.6K
R101
10K
(8)
Q22
R117
10K
ZD8
R118
47K
C59
0.047uF
T1
1
2
4
5
3
C9
150pF
D4
R12
2.4K 1W
R13
2.4K 1W
(7)
R9
1K
(3)
RQ13
4.7K
47K
47K
4.7K
(2)
VCC
(1)
43
33
IC7
(I/F)
IC8
(MPU)
60
(6)

Figure 2-17 Circuit 13

4.14 Manual Flash

1) Manual Flash

(1) Pressing the mode switch informs pin No.70 of IC8 that the selected mode is the manual mode.
(The default for this mode is 1/1, and the intensity level (1/1 to 1/128) can be selected by the (+) and (-) switches.)

(2) The information of this mode is relayed from pins No.95 to 98 of IC8 to pins No.15 to 18 of IC7.

(3) When this information is received, IC7 informs pin No.2 of IC6 to use PD1.

(4) Releasing the camera causes the X and STSP signals from being input to pins No.8 and 10 of IC7.

(5) These signals cause the main flash trigger signal to be generated from pins No.35 and 36 of IC7 in order to start main flash. (For details, see 4.5 Main Flash.)

(6) When flash starts, the flash intensity is input to PD1.

(7) This information is sent to pin No.55 of IC7 to pin No.8 of IC6.

(8) IC7 compares this flash intensity and the set mode (intensity level). When the intensity is appropriate, the flash stop signal is output from pin No.34 of IC7.

(9) This signal operates the flash stop circuit to stop flash.
(For details, see 4.6 Flash Control.)

2) Multi-flash

* Though multi-flash is basically the same as manual-flash above, the following points are added.

(10) Pressing the mode switch twice causes the multi-flash mode to be entered to IC8. This information is also relayed to IC7.

(11) By this, IC7 learns that the mode is the multi-flash mode.

(12) When the flash signals (X and STSP) are sent from the camera, the trigger signal matched to the multi-flash mode is repeatedly output from IC7, and multi-flash is carried out.
(Stopping multi-mode flash is the same as that for the manual flash mode.)

Part 3

Repair Information

1. REPAIR PREPARATIONS

1.1 BLEED the MAIN CAPACITORS!

Even after a full power flash discharge, a charge of 70 to 90 volts remains on the main capacitors in the flash circuit. Therefore, always bleed the capacitors before starting any repair.

(1) Set the flash head to the normal position (bounce 0° position).
(2) Peel off the rubber cover around the bounce lock knob.
(3) In the figure below, you can see the main capacitor (+) terminal. Short this terminal and the shoe GND terminal with a bleeder resistor.

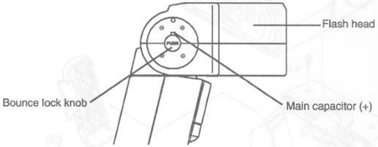


Figure 3-1 Capacitor Bleed Points

1.2 Assembly and Disassembly Precautions

The structure of the flash unit is basically the same as that for the 420EZ and 430EZ. So, the same disassembly procedure is used. Numbering in the figures (1), (2), etc. indicates the disassembly order. When assembling, follow the order of these numbers in reverse.

1.3 Tools Lists

Tool Name:	Used for:
Light Meter (Flash Meter)	Adjustment of M G-No.
Transistor Pack	All adjustments
Multi-meter (voltmeter)	Full charging voltage adjustment, pilot lamp lighting adjustment
Tripod	Adjustment of FA *f*/stop, M G-No.
Standard Reflector	Adjustment of FA *f*/stop, M G-No.
Multi-camera Tester (EF8000/5000/500)	Disassembly
Camera (EOS1-N)	Adjustment of M G-No.
Lens (EF 50 mm f/1.8)	Adjustment of FA *f*/stop

2. ASSEMBLY and DISASSEMBLY

2.1 Body Cover (F)

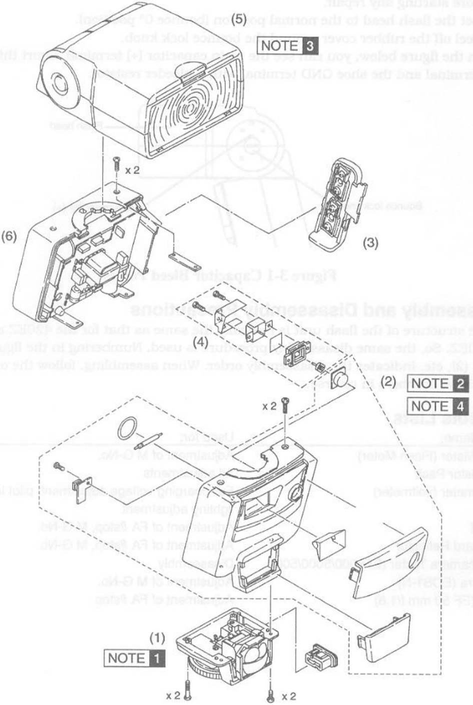

(5)
NOTE 3
x 2
(6)
(3)
(4)
(2)
NOTE 2
NOTE 4
x 2
(1)
NOTE 1
x 2
x 2

Figure 3-2 Disassembly of Cover (F)

1) Assembly and Disassembly Precautions

NOTE 1 : **Removing the shoe unit**

- Remove the four screws.
- Remove the three connectors from the body.

NOTE 2 : **Removing the cover (F)**

- Set flash head (5) to the vertical bounce (90°) and horizontal bounce (90°) positions, and remove the two screws on cover (F).
- Draw out cover (F), and remove the connector from the pre-flash unit ((J) CBA).
- Remove the two screws to remove the PSD and PSD holder (4).

NOTE 3 : **Removing the flash head**

- Slide the flash head toward the front. If it is pointed to either side it will come off, but if it is in the normal front-facing position, the bounce lock knob must be pressed while removing it. Note that the removal of the connector with the board in the rear half (explained on the following page) should be disconnected at this time.

NOTE 4 : **Assembling cover (F)**

- When assembling cover (F), pay attention to the connector leads coming from the flash head, and take care to prevent the leads from becoming nipped.

1) Assembly and Disassembly Precautions

NOTE 1 : **Removing the shoe unit**

- Remove the four screws.
- Remove the three connectors from the body.

NOTE 2 : **Removing the cover (F)**

- Set flash head (5) to the vertical bounce (90°) and horizontal bounce (90°) positions, and remove the two screws on cover (F).
- Draw out cover (F), and remove the connector from the pre-flash unit ((J) CBA).
- Remove the two screws to remove the PSD and PSD holder (4).

NOTE 3 : **Removing the flash head**

- Slide the flash head toward the front. If it is pointed to either side it will come off, but if it is in the normal front-facing position, the bounce lock knob must be pressed while removing it. Note that the removal of the connector with the board in the rear half (explained on the following page) should be disconnected at this time.

NOTE 4 : **Assembling cover (F)**

- When assembling cover (F), pay attention to the connector leads coming from the flash head, and take care to prevent the leads from becoming nipped.

2.2 Cover (R)

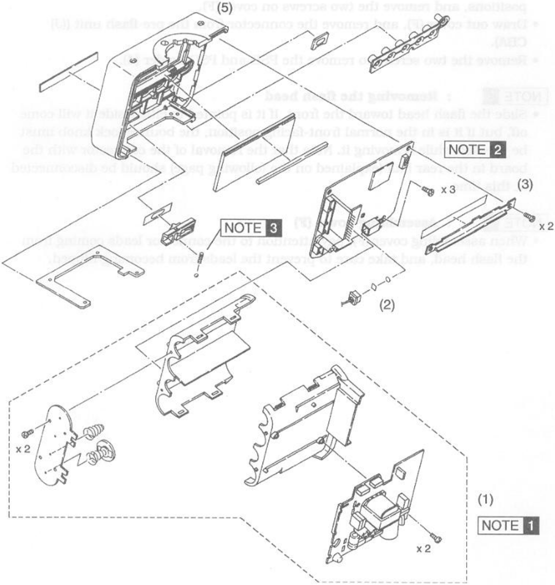

(5)
NOTE 2
x 3
(3)
x 2
NOTE 3
(2)
x 2
(1)
NOTE 1
x 2

Figure 3-3 Disassembly of Cover (R)

1) Assembly and Disassembly Precautions

NOTE 1 : **Removing the battery box, (B) CBA and (C) CBA**

- Remove the three connectors on (B) CBA from the flash head.
- Remove the 2-pin connector on (B) CBA from (A) CBA.
- Remove the 14-pin connector between (A) CBA and (B) CBA.

NOTE 2 : **Removing the (A) CBA connector**

- Remove the four connectors from the flash head.
- Remove PD2 and optical connector (2) from the soldered surface side of (A) CBA.
  (At this point, the flash head becomes free.)
- Remove the five screws and CBA holder.

NOTE 3 : **Removing the main switch**

- When (A) CBA is removed, the main switch spring and steel ball become free.

2.3 Flash Head

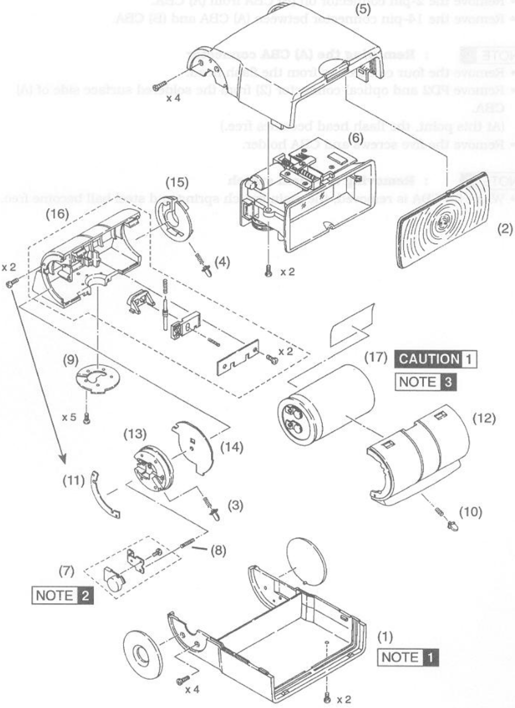

(5)
x 4
(6)
(15)
(16)
x 2
(4)
x 2
(2)
x 2
(9)
(17)
CAUTION 1
NOTE 3
x 5
(13)
(14)
(12)
(11)
(3)
(10)
(8)
(7)
NOTE 2
(1)
NOTE 1
x 4
x 2

Figure 3-4 Disassembly of Flash Head

1) Assembly and Disassembly Precautions

NOTE 1 : **Removing flash cover (L)**

- When flash cover (L) is removed, you can see click pins (5) and (6) at both of the left and right pivots. When assembling the click pins, make sure that the click pins are firmly inserted before attaching the flash cover (L).

NOTE 2 : **Assembling the bounce lock knob**

- After assembling the bounce lock knob, press in the button to check movement of the bounce lock. Make sure that the spring does not become loose.

CAUTION 1 : **Main capacitor**

- Always bleed the main capacitor before disassembling. (See page 3-1, "1.1 Bleed the Main Capacitors.")

NOTE 3 : **Assembling the main capacitor**

- When assembling the main capacitor, assemble as shown in Figure 3-5 so that the main capacitor (+) terminal is visible through the hole (see Figure 3-1) in the flash cover.

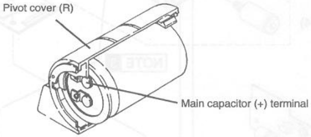


Figure 3-5 Assembling the Main Capacitor

2.4 Flash Unit

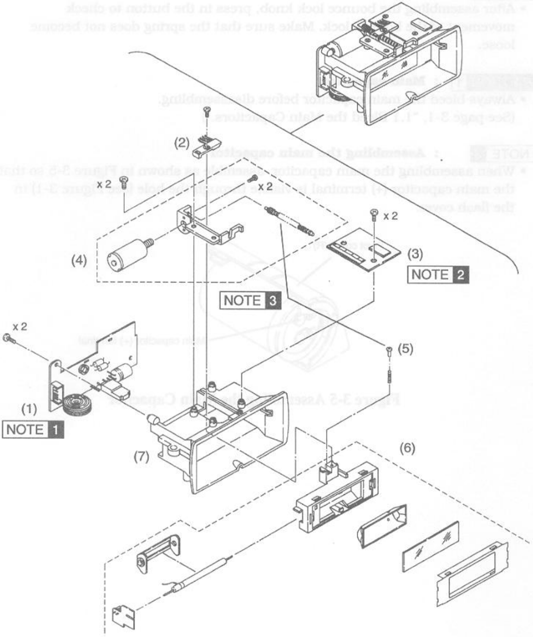

(2)
x 2
x 2
x 2
(4)
(3)
NOTE 2
NOTE 3
x 2
(5)
(1)
NOTE 1
(7)
(6)

Figure 3-6 Disassembly of the Flash Unit

1) Assembly and Disassembly Precautions

NOTE 1 : **Removing (D) CBA**

- Remove the connector from main flash unit (L) CBA.
- Remove the two screws fastening (D) CBA.
- When assembling, prevent the lead wires of the above connectors and the optical connector from being pinched.

NOTE 2: **Removing (E) CBA**

- Remove the screw to remove zoom switch (2).
- Remove the two lead wires (red, black) from the zoom motor.
- Remove the two screws fastening (E) CBA.

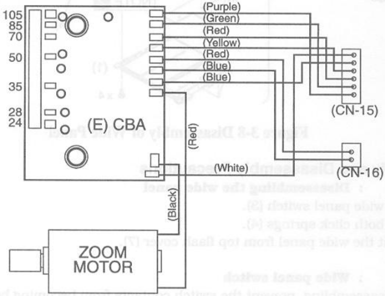

105
85
70
50
35
28
24
(E) CBA
(Purple)
(Green)
(Red)
(Yellow)
(Red)
(Blue)
(Blue)
(CN-15)
(Red)
(White)
(CN-16)
(Black)
ZOOM
MOTOR

Figure 3-7 (E) CBA

NOTE 3 : **Assembling the zoom pin**

- When assembling the zoom pin, make sure that zoom pin (5) is held down by the zoom shaft. (Take care to prevent the zoom pin and the spring from becoming loose.).

2.5 Wide Panel

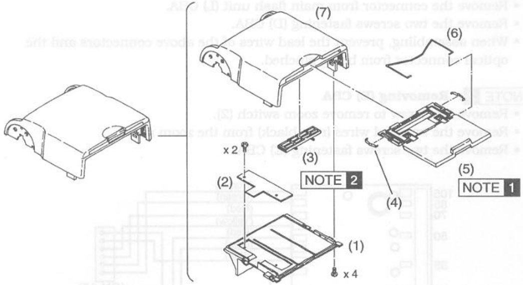


Figure 3-8 Disassembly of Wide Panel

1) Assembly and Disassembly Precautions

NOTE 1 : **Disassembling the wide panel**

- Remove wide panel switch (3).
- Remove both click springs (4).
- Draw out the wide panel from top flash cover (7).

NOTE 2 : **Wide panel switch**

- When disassembling, prevent the switch contacts from becoming bent.

2.5 Shoe Unit

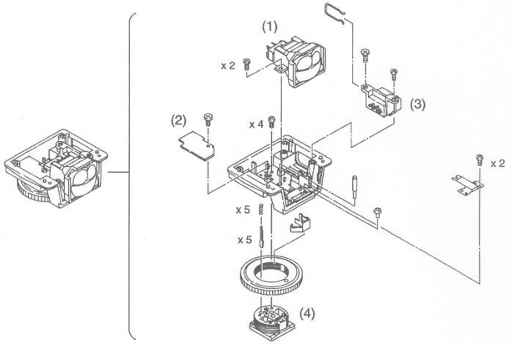

(1)
x 2
(3)
(2)
x 4
x 2
x 5
x 5
(4)

Figure 3-9 Disassembly of Shoe Unit

<MEMO>

3. ADJUSTMENT

3.1 Adjustment Items

The following four items must be adjusted.

(1) Full charging voltage adjustment ------------VR1
(Adjustment is required when replacing IC8, (A) CBA, (B) CBA, and (D) CBA.)

(2) Pilot lamp lighting adjustment----------------VR2
(Adjustment is required when replacing IC7, (A) CBA and (B) CBA.)

(3) FA aperture adjustment
(Adjustment is required when replacing IC6, IC7, PD2 and (A) CBA.)
- Short distance at 35 mm:-------------------VR6 (gain)
- Long distance at 35 mm: -------------------VR3 (level)

(4) Manual Low guide number adjustment -----VR5
(Adjustment is required when replacing PD1, IC6, IC7 and (A) CBA.)

* All of the above variable resistors can be externally adjusted by peeling off the blind plate.

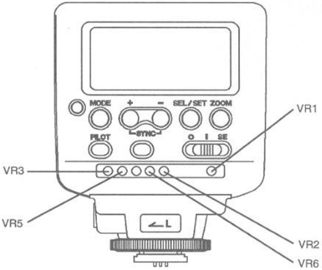


Figure 3-10 Position of Adjustment Resistors

3.2 Full charging voltage adjustment

<Purpose>

To adjust the maximum charging voltage of the capacitors.

<Standard>

330 ± 3V

<Tools>

- Transistor pack
- Multi-meter (voltmeter)

<Adjustment Method>

1. Remove the rubber cap around the vertical bounce unlock button on the flash head, and bleed the main capacitor. (For details on how to bleed the capacitors, see page 3-1.)
2. Connect the transistor pack to the flash battery contact, and apply a voltage of 5.8V.
3. Turn the main switch on to start charging.
4. Read the voltage of the main capacitor when charging has finished, and adjust VR-1 so that the voltage becomes 330±3V. (Measure the same location as when bleeding the capacitors.)

3.3 Pilot lamp lighting adjustment

<Purpose>

To adjust the lighting voltage of the red pilot lamp.

<Standard>

274 ± 2V

<Tools>

- Transistor pack
- Multi-meter (voltmeter)

<Adjustment Method>

1. Remove the rubber cap around the vertical bounce unlock button on the flash head, and bleed the main capacitor. (For details on how to bleed the capacitors, see page 3-1.)
2. Connect the transistor pack to the flash battery contact, and apply a voltage of 5.8V.
3. Turn the main switch on to start charging.
4. Read the voltage of the main capacitor when the red pilot lamp lights, and adjust VR-2 so that the voltage becomes 274±2V. (Measure the same location as when bleeding the capacitors.)

3.4 FA Aperture adjustment

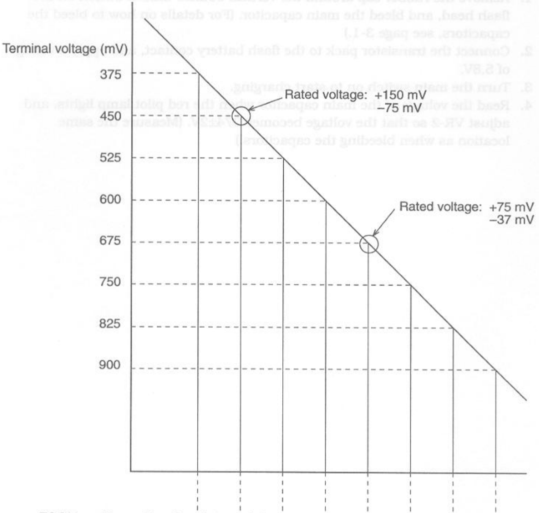
<Purpose>

To adjust the *f*/stop information (voltage) output to the camera according to the photosensor intensity during pre-flash in the A-TTL mode.

<Standard>

The following outputs shown in the table must be output under the following conditions.

1) Apply a voltage of 1.20V to the EFID terminal.
2) Use the standard reflector.
3) Use new batteries in a fully charged state. (20 seconds after the red lamp has lit)



ZOOM position	Shooting distance (m) ⇒								
35 mm		0.81	1.14	1.61	2.28	3.22	4.56	6.44	9.11
			Set A distance			Set B distance			

Figure 3-11 FA *f*/stop Ratings (voltage)

<Tools>

- Transistor pack
- Multi-meter (voltmeter)
- Camera (EOS1-N)
- Lens (EF 50 mm f/1.8)
- Tripod
- Standard Reflector

<Adjustment Method>

1. Apply a voltage of 1.2V to the EFID terminal in order to output the AV value in analog.
2. Attach and draw out the fine jumber lead wire capable of measuring the AV terminal from the flash body.
3. In order to prevent the influence of external light, set up the equipment as shown in Figure 3-16 in a dark room of EV9 or less.
   (For details on distances A and B, refer to the ratings table for details.)
4. Turn the flash main switch on, set the zoom position to 35mm, press camera switch 1 20 seconds after the red lamp lights, and measure the voltage of the AV terminal.
5. Adjust VR3 (level) and VR6 (gain) so that the above measurement results (for both settings A and B) fall within the ratings.

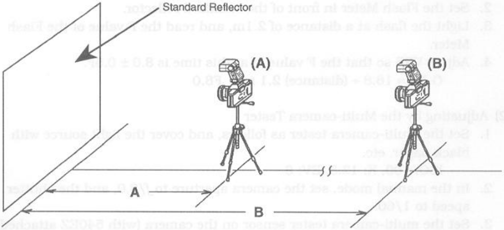


Figure 3-12 Setting during FA *f*/stop Adjustment

3.5 Manual Low guide number adjustment

<Purpose>

To adjust the flash intensity (guide number) in the manual flash mode (Lo-1/4).

<Standard>

G-No. = **16.8 ± 0.5 F** (ISO: 100)

CAUTION

- * The Flash Meter is used to measure the guide number. However, measurement can be carried out with the multi-camera tester if the Flash Meter is not available.
- * This adjustment must be carried out in a darkroom.

<Tools>

- Light Meter (Flash Meter)
- Standard Reflector
- Multi-camera Tester (EF8000/5000/500)

<Adjustment Method>

(1) Adjusting by the Flash Meter

1. Set the flash to ZOOM position: 35mm, and flash mode: M Lo 1/4.
2. Set the Flash Meter in front of the standard reflector.
3. Light the flash at a distance of 2.1m, and read the F value of the Flash Meter.
4. Adjust VR5 so that the F value of at this time is 8.0 ± 0.5F.
   G-No = 16.8 ÷ (distance) 2.1 m = F8.0

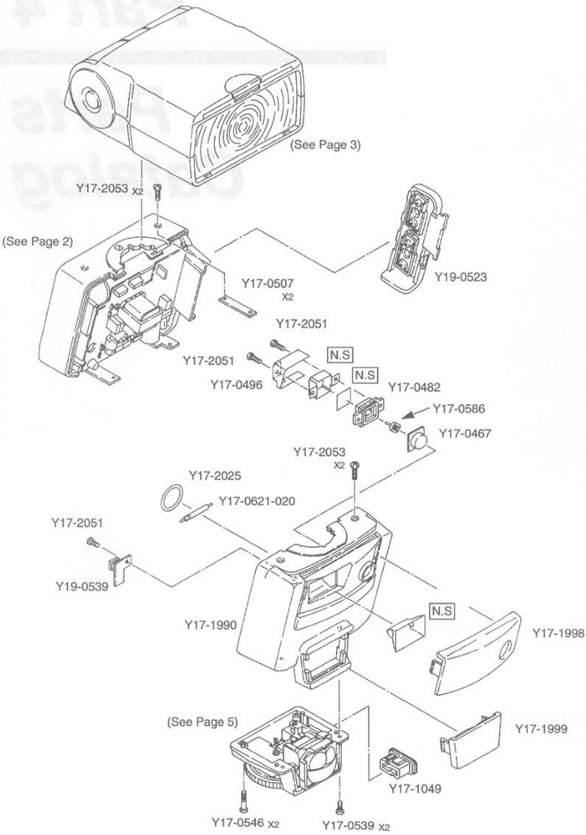
(2) Adjusting by the Multi-camera Tester

1. Set the multi-camera tester as follows, and cover the light source with black paper, etc.
   ISO: 100, K: 12.5, EV: 6
2. In the manual mode, set the camera aperture to *f*/8.0, and the shutter speed to 1/60.
3. Set the multi-camera tester sensor on the camera (with 540EZ attached), and shoot the standard reflector from a distance of 2.1m.
4. Adjust VR5 so that the multi-camera tester readout at this time is 0±0.5F.

Part 4

Parts Catalog

CANON SPEEDLITE 540EZ

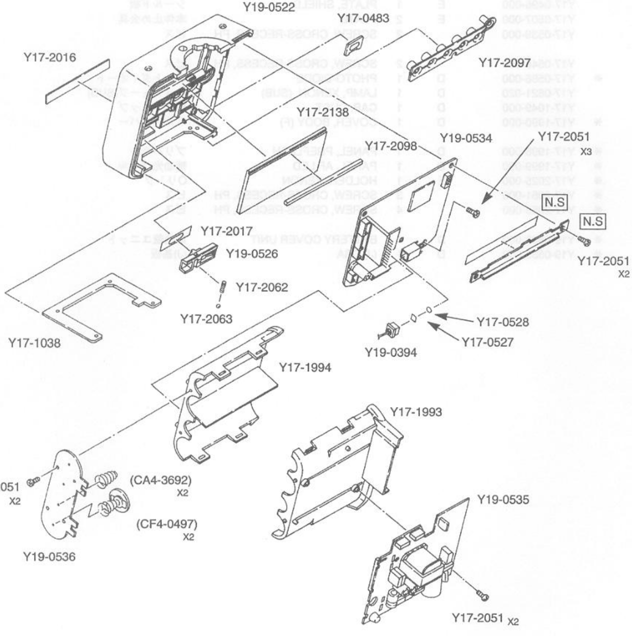

(See Page 3)
Y17-2053 x2
(See Page 2)
Y19-0523
Y17-0507
x2
Y17-2051
Y17-2051
N.S
Y17-0496
N.S
Y17-0482
Y17-0586
Y17-0467
Y17-2053
x2
Y17-2025
Y17-0621-020
Y17-2051
Y19-0539
Y17-1990
N.S
Y17-1998
(See Page 5)
Y17-1999
Y17-1049
Y17-0546 x2
Y17-0539 x2

PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
*	Y17-0467-000	D	1	LENS, PD	受光レンズ
	Y17-0482-000	E	1	HOLDER, PD	PDホルダー
	Y17-0496-000	E	1	PLATE, SHIELD	シールド板
	Y17-0507-000	E	2	PLATE	本体止め金具
	Y17-0539-000		2	SCREW, CROSS-RECESS, PH	ビス
	Y17-0546-000		2	SCREW, CROSS-RECESS, PH	ビス
*	Y17-0586-000	D	1	PHOTO-DIODE	フォトダイオード
	Y17-0621-020	D	1	LAMP, XENON (SUB)	Ｘｅチューブ(SUB)
	Y17-1049-000	D	1	CAP, DUST	防塵キャップ
*	Y17-1990-000	D	1	COVER, BODY (F)	本体前カバー
*	Y17-1998-000	D	1	PANEL, PREFLASH	プリパネル
*	Y17-1999-000	D	1	PANEL, AF LED	補助光パネル
*	Y17-2025-000	E	1	HOLDER, XENON	Oリング
*	Y17-2051-000		3	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2053-000		4	SCREW, CROSS-RECESS, PH	ビス
*	Y19-0523-000	D	1	BATTERY COVER UNIT	電池蓋ユニット
*	Y19-0539-000	D	1	(J) CBA	(J)基板

CANON SPEEDLITE 540EZ

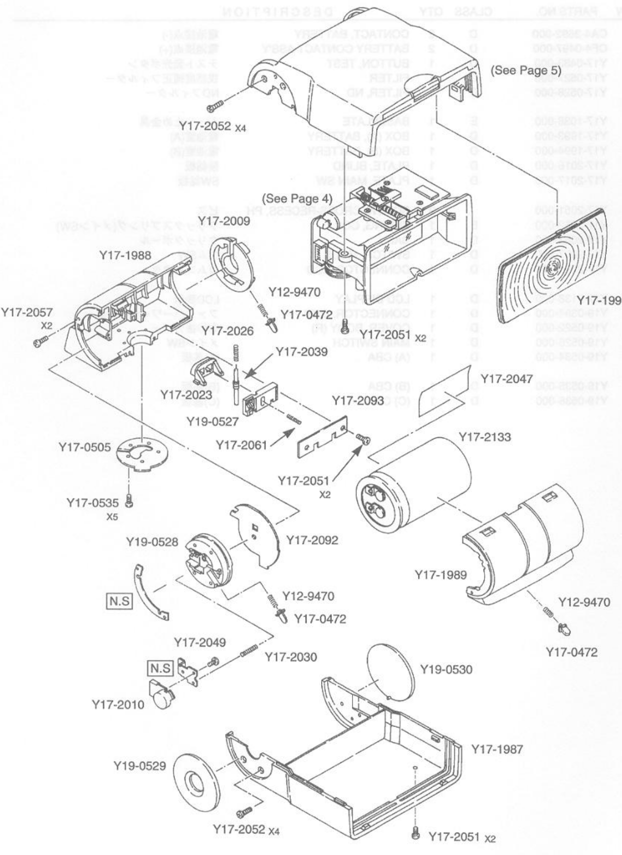

Y19-0522
Y17-0483
Y17-2016
Y17-2097
Y17-2138
Y17-2098
Y19-0534
Y17-2051
X3
N.S
N.S
Y17-2051
X2
Y17-2017
Y19-0526
Y17-2062
Y17-2063
Y17-0528
Y17-0527
Y19-0394
Y17-1038
Y17-1994
Y17-1993
Y17-2051
X2
(CA4-3692)
X2
(CF4-0497)
X2
Y19-0536
Y19-0535
Y17-2051 X2

PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA4-3692-000	D	2	CONTACT, BATTERY	電池接点(-)
	CF4-0497-000	D	2	BATTERY CONTACT ASS'Y	電池接点(+)
	Y17-0483-000	D	1	BUTTON, TEST	テスト発光ボタン
	Y17-0527-000	D	1	FILTER	視感度補正フィルター
	Y17-0528-000	D	1	FILTER, ND	NDフィルター
	Y17-1038-000	E	1	BASEPLATE	シュー止め金具
*	Y17-1993-000	D	1	BOX (A), BATTERY	電池室(A)
*	Y17-1994-000	D	1	BOX (B), BATTERY	電池室(B)
*	Y17-2016-000	D	1	PLATE, BLIND	後銘板
*	Y17-2017-000	D	1	PLATE, MAIN SW	SW銘板
*	Y17-2051-000		9	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2062-000	E	1	SPRING, COIL	クリックスプリング(メインSW)
*	Y17-2063-000	D	1	BALL	クリックボール
*	Y17-2097-000	D	1	SWITCH, MODE	ゴムSW
*	Y17-2098-000	D	1	CONNECTOR, LCD	ゴムコネクター
*	Y17-2138-000	D	1	LCD DISPLAY	LCD表示
	Y19-0394-000	D	1	CONNECTOR, OPT'	ファイバーワイヤーユニット
*	Y19-0522-000	D	1	COVER, BODY (R)	本体後カバー
*	Y19-0526-000	D	1	MAIN SWITCH	メインSW
*	Y19-0534-000	D	1	(A) CBA	(A)基板
*	Y19-0535-000	D	1	(B) CBA	(B)基板
*	Y19-0536-000	D	1	(C) CBA	(C)基板

CANON SPEEDLITE 540EZ

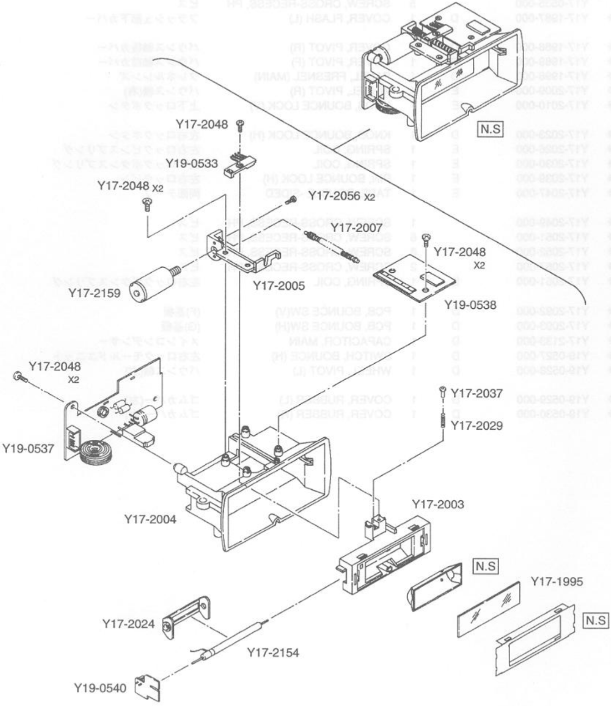

(See Page 5)
Y17-2052 X4
(See Page 4)
Y17-2009
Y17-1988
Y17-1996
Y12-9470
Y17-0472
Y17-2057
X2
Y17-2026
Y17-2051 X2
Y17-2039
Y17-2047
Y17-2023
Y17-2093
Y19-0527
Y17-2133
Y17-0505
Y17-2061
Y17-2051
X2
Y17-0535
X5
Y19-0528
Y17-2092
Y17-1989
N.S
Y12-9470
Y17-0472
Y12-9470
Y17-2049
Y17-2030
Y17-0472
N.S
Y19-0530
Y17-2010
Y17-1987
Y19-0529
Y17-2052 X4
Y17-2051 X2

PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	Y12-9470-000	E	3	SPRING, COIL	圧縮スプリング
	Y17-0472-000	D	3	PIN, CLICK	クリックピン
	Y17-0505-000	E	1	PLATE, DETENT	左右回転板
	Y17-0535-000		5	SCREW, CROSS-RECESS, PH	ビス
*	Y17-1987-000	D	1	COVER, FLASH (L)	フラッシュ部下カバー
*	Y17-1988-000	D	1	COVER, PIVOT (R)	バウンス軸後カバー
*	Y17-1989-000	D	1	COVER, PIVOT (F)	バウンス軸前カバー
*	Y17-1996-000	D	1	PANEL, FRESNEL (MAIN)	フレネルレンズ
*	Y17-2009-000	E	1	WHEEL, PIVOT (R)	バウンス軸(右)
*	Y17-2010-000	E	1	KNOB, BOUNCE LOCK (V)	上下ロックボタン
*	Y17-2023-000	D	1	KNOB, BOUNCE LOCK (H)	左右ロックボタン
*	Y17-2026-000	E	1	SPRING, COIL	左右ロックピンスプリング
*	Y17-2030-000	E	1	SPRING, COIL	上下ロックボタンスプリング
*	Y17-2039-000	E	1	PIN, BOUNCE LOCK (H)	左右ロックピン
*	Y17-2047-000	E	1	TAPE, DOUBLE -SIDED	両面テープ
*	Y17-2049-000		1	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2051-000		6	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2052-000		8	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2057-000		2	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2061-000	E	1	SPRING, COIL	左右ロックボタンスプリング
*	Y17-2092-000	D	1	PCB, BOUNCE SW(V)	(F)基板
*	Y17-2093-000	D	1	PCB, BOUNCE SW(H)	(G)基板
*	Y17-2133-000	D	1	CAPACITOR, MAIN	メインコンデンサー
*	Y19-0527-000	D	1	SWITCH, BOUNCE (H)	左右ロックモールドユニット
*	Y19-0528-000	D	1	WHEEL, PIVOT (L)	バウンス軸(左)
*	Y19-0529-000	D	1	COVER, RUBBER (L)	ゴムカバー(左)
*	Y19-0530-000	D	1	COVER, RUBBER (R)	ゴムカバー(右)

CANON SPEEDLITE 540EZ


N.S
Y17-2048
Y19-0533
Y17-2048 X2
Y17-2056 X2
Y17-2007
Y17-2048
X2
Y17-2159
Y17-2005
Y19-0538
Y17-2048
X2
Y17-2037
Y17-2029
Y19-0537
Y17-2003
Y17-2004
N.S
Y17-1995
N.S
Y17-2024
Y17-2154
Y19-0540

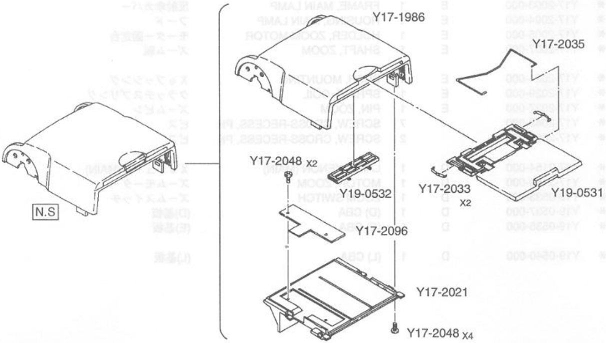
PARTS LIST

REF.NO. C50-0711, 0712

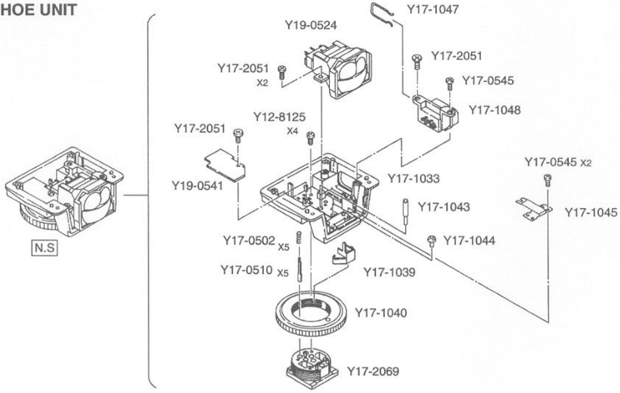
NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
*	Y17-1995-000	D	1	GRASS, FRONT	フロントパネル
*	Y17-2003-000	E	1	FRAME, MAIN LAMP	反射傘カバー
*	Y17-2004-000	E	1	HOUSING, MAIN LAMP	フード
*	Y17-2005-000	E	1	HOLDER, ZOOM MOTOR	モーター固定台
*	Y17-2007-000	E	1	SHAFT, ZOOM	ズーム軸
*	Y17-2024-000	E	1	BUSH, MOUNTING	Ｘｅブッシング
*	Y17-2029-000	E	1	SPRING, COIL	クラッチスプリング
*	Y17-2037-000	E	1	PIN, ZOOM	ズームピン
*	Y17-2048-000		7	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2056-000		2	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2154-000	D	1	LAMP, XENON (MAIN)	Ｘｅチューブ(MAIN)
*	Y17-2159-000	D	1	MOTOR, ZOOM	ズームモーター
*	Y19-0533-000	D	1	ZOOM SWITCH	ズームスイッチ
*	Y19-0537-000	D	1	(D) CBA	(D)基板
*	Y19-0538-000	D	1	(E) CBA	(E)基板
*	Y19-0540-000	D	1	(L) CBA	(L)基板

CANON SPEEDLITE 540EZ

· WIDE PANEL


N.S
Y17-1986
Y17-2035
Y17-2048 x2
Y19-0532
Y17-2033
x2
Y19-0531
Y17-2096
Y17-2021
Y17-2048 x4

· SHOE UNIT


N.S
Y17-1047
Y19-0524
Y17-2051
Y17-2051
x2
Y17-0545
Y17-1048
Y12-8125
x4
Y17-2051
Y19-0541
Y17-1033
Y17-0545 x2
Y17-1043
Y17-1045
Y17-1044
Y17-0502 x5
Y17-0510 x5
Y17-1039
Y17-1040
Y17-2069

PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	Y12-8125-000		4	SCREW, CROSS-RECESS, PH	ビス
	Y17-0502-000	D	5	SPRING, COIL	シュー接点スプリング
	Y17-0510-000	D	5	CONTACT, SHOE	シュー接点
	Y17-0545-000		3	SCREW, CROSS-RECESS, PH	ビス
	Y17-1033-000	D	1	CASE, SHOE	シューケース
	Y17-1039-000	D	1	CONTACT, SHOE (-)	シュー(-)接片
	Y17-1040-000	D	1	NUT, SHOE	シューナット
	Y17-1043-000	D	1	PIN, SHOE LOCK	シューロックピン
	Y17-1044-000	D	1	PIN, LOCK	ロック解除ピン
	Y17-1045-000	D	1	CONTACT, SHOE LOCK	シューロックスプリング
*	Y17-1047-000	E	1	SPRING, CONNECTOR	コネクタースプリング
*	Y17-1048-000	E	1	CONNECTOR, POWER	外部電源コネクター
*	Y17-1986-000	D	1	COVER, FLASH (U)	フラッシュ部上カバー
*	Y17-2021-000	E	1	HOLDER, WIDE PANEL	仕切り板
*	Y17-2033-000	E	2	SPRING, CLICK	クリックスプリング
*	Y17-2035-000	E	1	SPRING, WIDE PANEL	ワイドパネルスプリング
*	Y17-2048-000		6	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2051-000		4	SCREW, CROSS-RECESS, PH	ビス
*	Y17-2069-000	C	1	SHOE	シューモールド
*	Y17-2096-000	D	1	PCB, WIDE PANEL SW	(K)基板
*	Y19-0524-000	D	1	AF LED UNIT	補助光ユニット
*	Y19-0531-000	D	1	WIDE PANEL UNIT	ワイドパネルユニット
*	Y19-0532-000	D	1	SWITCH, WIDE PANEL	ワイドパネルスイッチ
*	Y19-0541-000	D	1	(H) CBA	(H)基板

ELECTRIC PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	REMARK	PAGE
＊	Y17-2171-000		1	LEAD ASS'Y, CN-1	リード線セット(CN-1)	
＊	Y17-2172-000		1	LEAD ASS'Y, CN-2	リード線セット(CN-2)	
＊	Y17-2174-000		1	LEAD ASS'Y, CN-4	リード線セット(CN-4)	
＊	Y17-2175-000		1	LEAD ASS'Y, CN-6	リード線セット(CN-6)	
＊	Y17-2176-000		1	LEAD ASS'Y, CN-7	リード線セット(CN-7)	
＊	Y17-2177-000		1	LEAD ASS'Y, CN-8	リード線セット(CN-8)	
＊	Y17-2178-000		1	LEAD ASS'Y, CN-9	リード線セット(CN-9)	
＊	Y17-2179-000		1	LEAD ASS'Y, CN-10	リード線セット(CN-10)	
＊	Y17-2180-000		1	LEAD ASS'Y, CN-11	リード線セット(CN-11)	
＊	Y17-2181-000		1	LEAD ASS'Y, CN-12	リード線セット(CN-12)	
＊	Y17-2182-000		1	LEAD ASS'Y, CN-13	リード線セット(CN-13)	
＊	Y17-2183-000		1	LEAD ASS'Y, CN-14	リード線セット(CN-14)	
＊	Y17-2184-000		1	LEAD ASS'Y, CN-15	リード線セット(CN-15)	
＊	Y17-2185-000		1	LEAD ASS'Y, CN-16	リード線セット(CN-16)	

INDEX OF PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	PAGE
	CA4-3692-000	2
	CF4-0497-000	2
	Y12-8125-000	5
	Y12-9470-000	3
*	Y17-0467-000	1
	Y17-0472-000	3
	Y17-0482-000	1
	Y17-0483-000	2
	Y17-0496-000	1
	Y17-0502-000	5
	Y17-0505-000	3
	Y17-0507-000	1
	Y17-0510-000	5
	Y17-0527-000	2
	Y17-0528-000	2
	Y17-0535-000	3
	Y17-0539-000	1
	Y17-0545-000	5
	Y17-0546-000	1
*	Y17-0586-000	1
	Y17-0621-020	1
	Y17-1033-000	5
	Y17-1038-000	2
	Y17-1039-000	5
	Y17-1040-000	5
	Y17-1043-000	5
	Y17-1044-000	5
	Y17-1045-000	5
*	Y17-1047-000	5
*	Y17-1048-000	5
	Y17-1049-000	1
*	Y17-1986-000	5
*	Y17-1987-000	3
*	Y17-1988-000	3
*	Y17-1989-000	3
*	Y17-1990-000	1
*	Y17-1993-000	2
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*	Y17-2005-000	4
*	Y17-2007-000	4
*	Y17-2009-000	3
*	Y17-2010-000	3
*	Y17-2016-000	2
*	Y17-2017-000	2
*	Y17-2021-000	5
*	Y17-2023-000	3
*	Y17-2024-000	4
*	Y17-2025-000	1
*	Y17-2026-000	3
*	Y17-2029-000	4
*	Y17-2030-000	3
*	Y17-2033-000	5
*	Y17-2035-000	5
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*	Y17-2047-000	3
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*	Y17-2049-000	3
*	Y17-2051-000	1, 2, 3, 5
*	Y17-2052-000	3
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*	Y17-2056-000	4
*	Y17-2057-000	3
*	Y17-2061-000	3
*	Y17-2062-000	2
*	Y17-2063-000	2
*	Y17-2069-000	5
*	Y17-2092-000	3
*	Y17-2093-000	3
*	Y17-2096-000	5
*	Y17-2097-000	2
*	Y17-2098-000	2
*	Y17-2133-000	3
*	Y17-2138-000	2

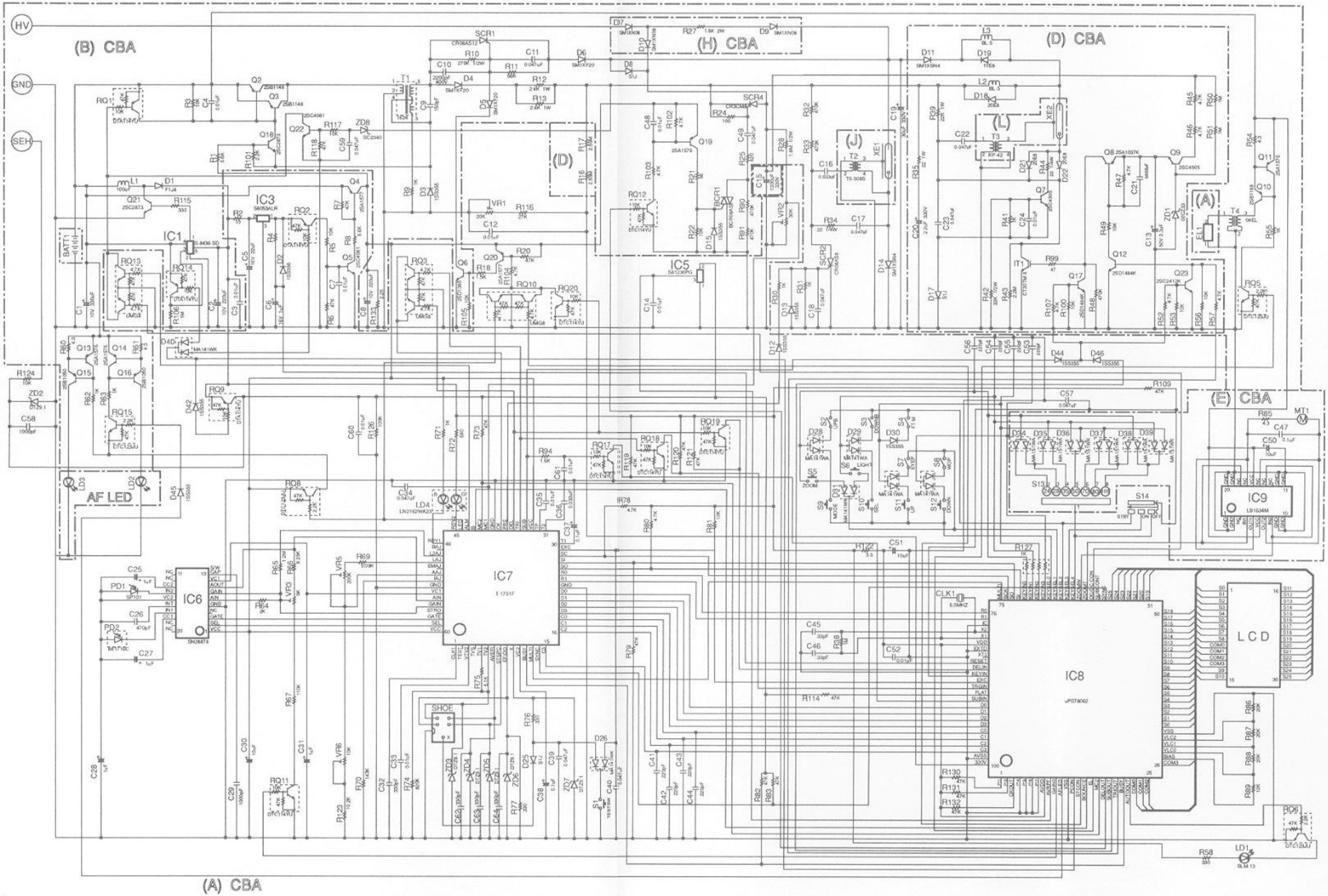
INDEX OF PARTS LIST

REF.NO. C50-0711, 0712

NEW	PARTS NO.	PAGE	NEW	PARTS NO.	PAGE
*	Y17-2154-000	4	*	Y19-0526-000	2
*	Y17-2159-000	4	*	Y19-0527-000	3
*	Y17-2171-000		*	Y19-0528-000	3
*	Y17-2172-000		*	Y19-0529-000	3
*	Y17-2174-000		*	Y19-0530-000	3
*	Y17-2175-000		*	Y19-0531-000	5
*	Y17-2176-000		*	Y19-0532-000	5
*	Y17-2177-000		*	Y19-0533-000	4
*	Y17-2178-000		*	Y19-0534-000	2
*	Y17-2179-000		*	Y19-0535-000	2
*	Y17-2180-000		*	Y19-0536-000	2
*	Y17-2181-000		*	Y19-0537-000	4
*	Y17-2182-000		*	Y19-0538-000	4
*	Y17-2183-000		*	Y19-0539-000	1
*	Y17-2184-000		*	Y19-0540-000	4
*	Y17-2185-000		*	Y19-0541-000	5
	Y19-0394-000	2			
*	Y19-0522-000	2			
*	Y19-0523-000	1			
*	Y19-0524-000	5			

Part 5

Electrical Diagrams


HV
GND
SEH
(B) CBA
(H) CBA
(D) CBA
(D)
(L)
(J)
(A)
(E) CBA
(A) CBA
BATT1
AF LED
IC1
IC3
IC5
IC6
IC7
T 1751F
IC8
uP078062
IC9
LB1634M
LCD
CLK1
5.0MHZ
SHOE
SCR1
SCR2
SCR4
T1
T2
T3
T4
XE1
XE2
MT1
LD1
LD2
LD3
LD4
PD1
PD2
S13
S14
ZOOM
MODE
LIGHT
TEST SW

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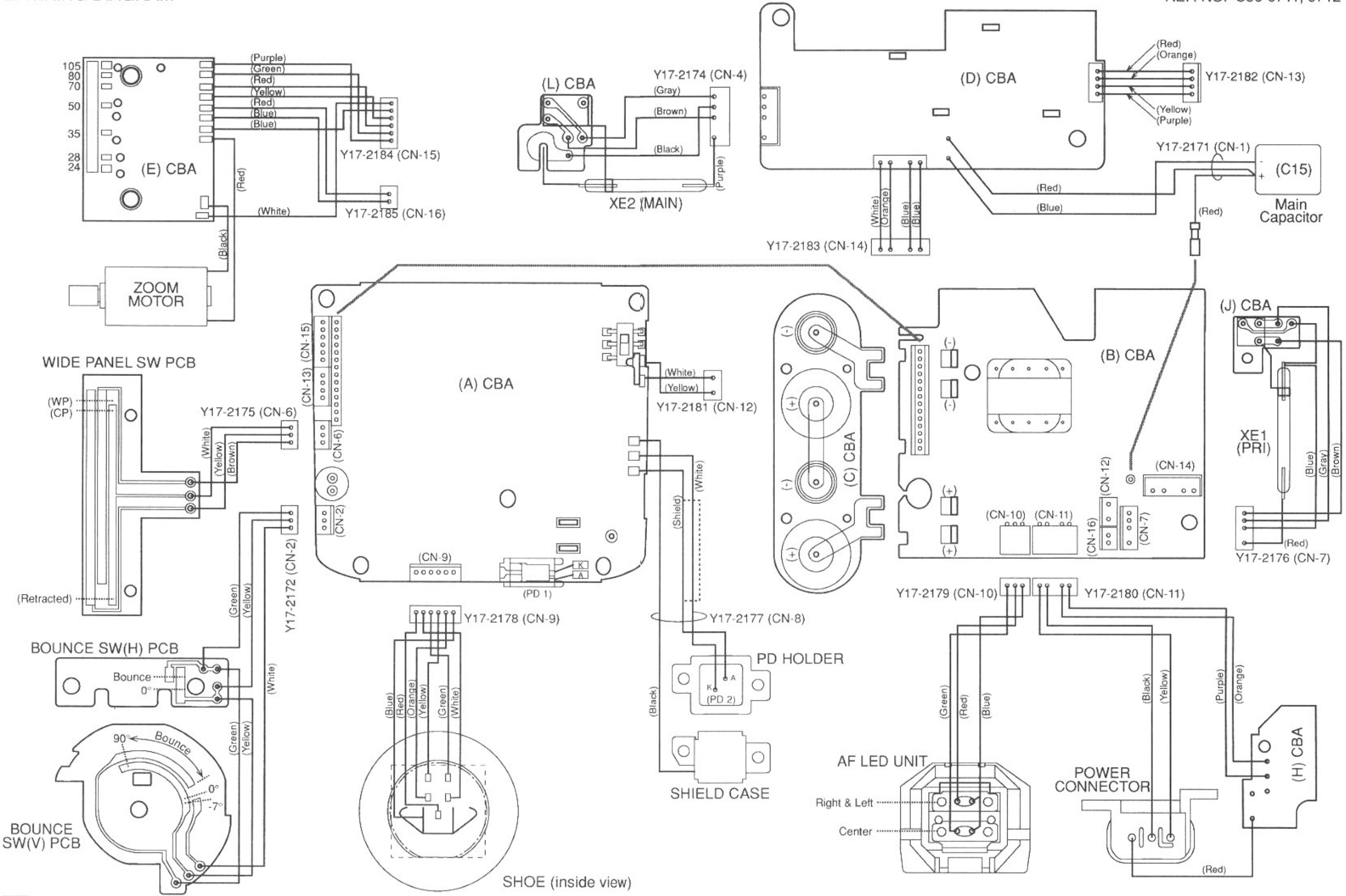
2. WIRING DIAGRAM


105
80
70
50
35
28
24
(E) CBA
(Purple)
(Green)
(Red)
(Yellow)
(Red)
(Blue)
(Blue)
Y17-2184 (CN-15)
(Red)
(White)
Y17-2185 (CN-16)
(Black)
ZOOM MOTOR
(L) CBA
Y17-2174 (CN-4)
(Gray)
(Brown)
(Black)
(Purple)
XE2 (MAIN)
(D) CBA
(Red)
(Orange)
(Yellow)
(Purple)
Y17-2182 (CN-13)
Y17-2171 (CN-1)
(C15)
Main Capacitor
(Red)
(Blue)
(Red)
(White)
(Orange)
(Blue)
(Blue)
Y17-2183 (CN-14)
WIDE PANEL SW PCB
(WP)
(CP)
(Retracted)
Y17-2175 (CN-6)
(White)
(Yellow)
(Brown)
(CN-15)
(CN-13)
(CN-6)
(CN-2)
(A) CBA
(White)
(Yellow)
Y17-2181 (CN-12)
(CN-9)
(PD 1)
K
A
(White)
(Shield)
Y17-2177 (CN-8)
(Black)
PD HOLDER
K
A
(PD 2)
SHIELD CASE
(C) CBA
(-)
(+)
(B) CBA
(CN-12)
(CN-14)
(CN-10)
(CN-11)
(CN-16)
(CN-7)
(J) CBA
XE1 (PRI)
(Blue)
(Gray)
(Brown)
(Red)
Y17-2176 (CN-7)
Y17-2179 (CN-10)
Y17-2180 (CN-11)
Y17-2172 (CN-2)
(Green)
(Yellow)
(White)
BOUNCE SW(H) PCB
Bounce
0°
BOUNCE SW(V) PCB
90°
Bounce
0°
-7°
(Green)
(Yellow)
Y17-2178 (CN-9)
(Blue)
(Red)
(Orange)
(Yellow)
(Green)
(White)
SHOE (inside view)
AF LED UNIT
Right & Left
Center
(Green)
(Red)
(Blue)
POWER CONNECTOR
(Black)
(Yellow)
(Red)
(Purple)
(Orange)
(H) CBA

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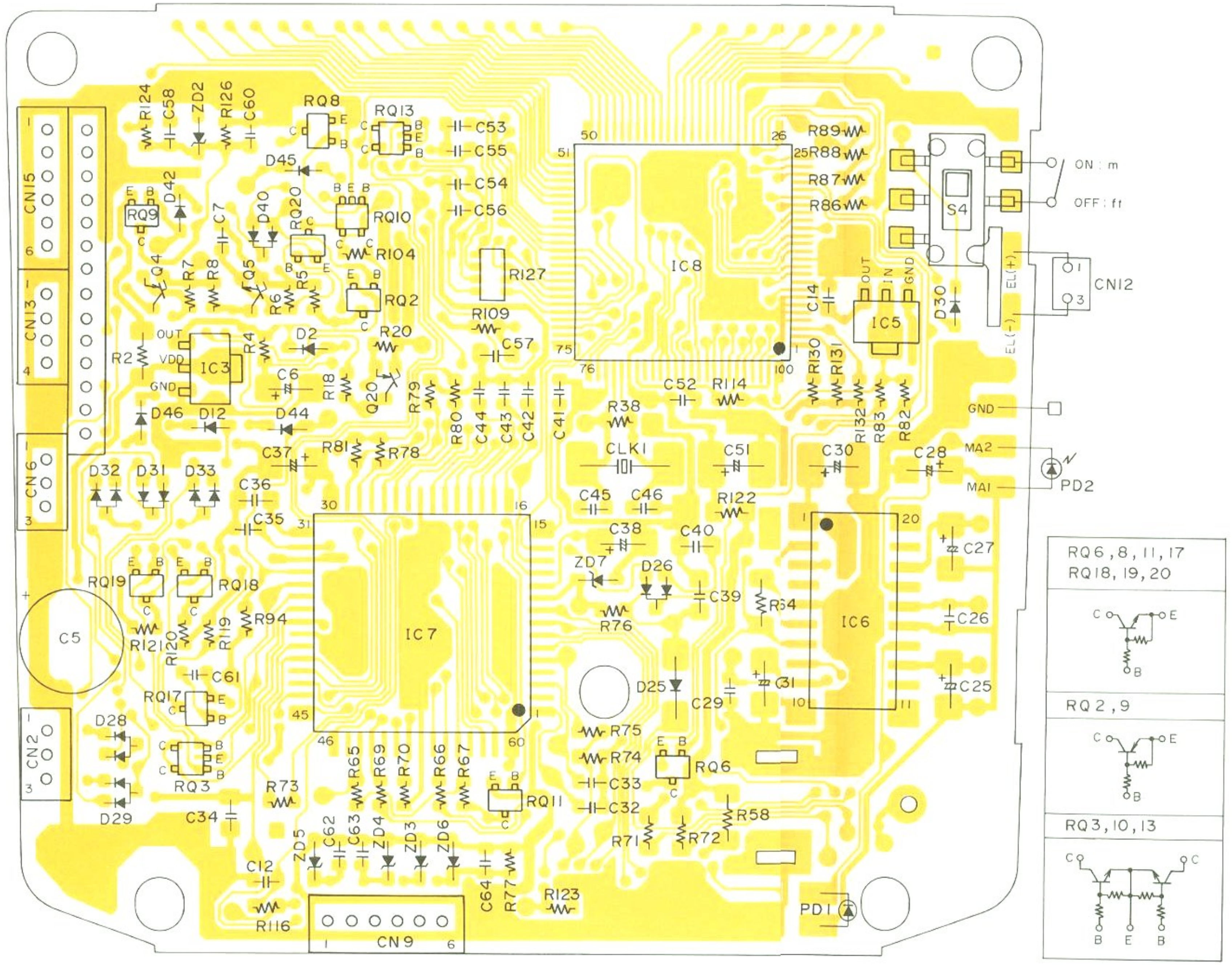
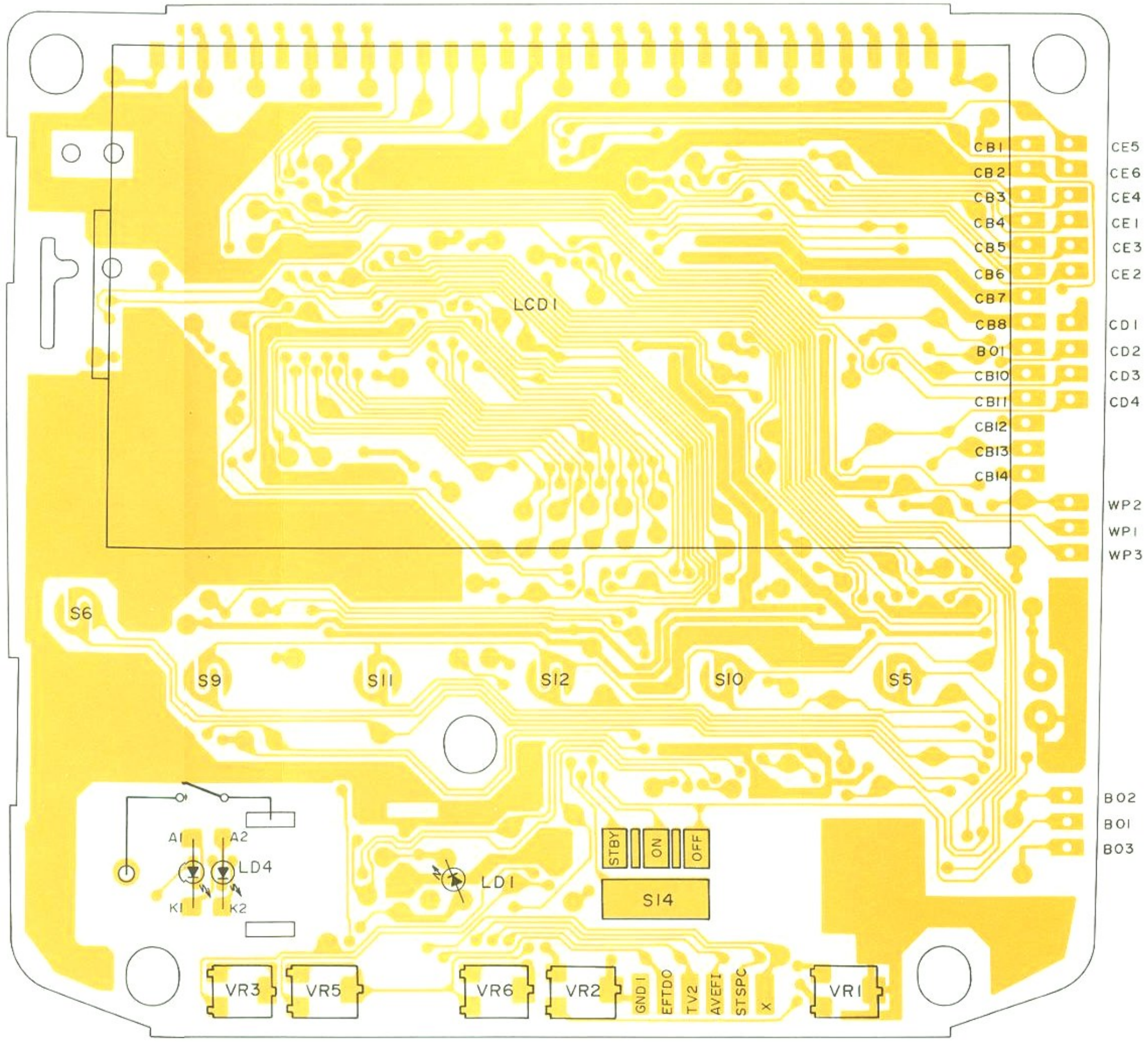
3. PATTERN DIAGRAM

3-1. (A) CBA


CN15
CN13
CN6
CN2
CN9
CN12
IC3
IC5
IC6
IC7
IC8
CLK1
S4
ON : m
OFF : ff
EL(+)
EL(-)
GND
MA2
MA1
PD1
PD2
C5
RQ2
RQ3
RQ6
RQ8
RQ9
RQ10
RQ11
RQ13
RQ17
RQ18
RQ19
RQ20
OUT
VDD
GND
IN
RQ6, 8, 11, 17
RQ18, 19, 20
RQ2, 9
RQ3, 10, 13
C
E
B


LCD1
CB1
CB2
CB3
CB4
CB5
CB6
CB7
CB8
B01
CB10
CB11
CB12
CB13
CB14
CE5
CE6
CE4
CE1
CE3
CE2
CD1
CD2
CD3
CD4
WP2
WP1
WP3
B02
B01
B03
S5
S6
S9
S10
S11
S12
S14
STBY
ON
OFF
LD1
LD4
A1
A2
K1
K2
VR1
VR2
VR3
VR5
VR6
GND1
EFTDO
TV2
AVEFT
STSPC
X

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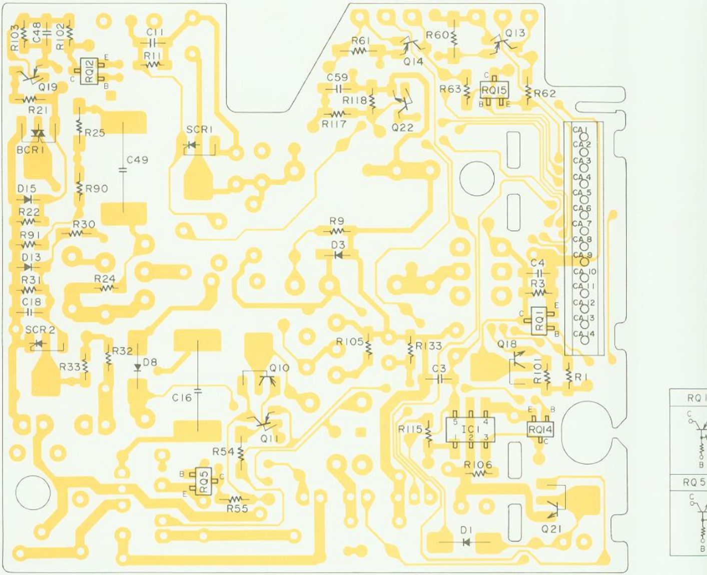
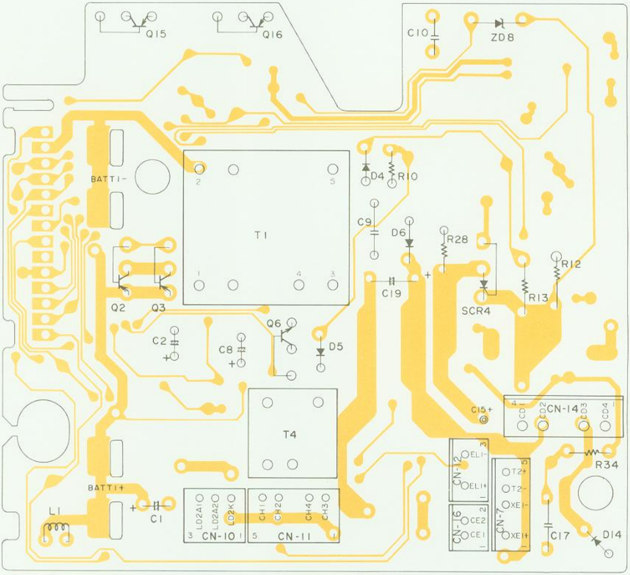
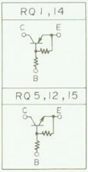
3-2. (B) CBA


R103
C48
R102
C11
R11
RQ12
E
C
B
Q19
R21
R25
BCR1
C49
SCR1
D15
R90
R22
R30
R91
D13
R31
R24
C18
SCR2
R32
R33
D8
C16
Q10
Q11
R54
RQ5
B
C
E
R55
R61
Q14
R60
Q13
C59
R118
R117
Q22
R63
RQ15
C
B
E
R62
CA1
CA2
CA3
CA4
CA5
CA6
CA7
CA8
CA9
CA10
CA11
CA12
CA13
CA14
R9
D3
C4
R3
RQ1
C
E
B
R105
R133
Q18
C3
R101
R1
R115
IC1
5
4
1
2
3
RQ14
E
B
C
R106
D1
Q21
RQ1
C
B
RQ5
C
B


Q15
Q16
C10
ZD8
BATT1-
T1
2
5
1
4
3
D4
R10
C9
D6
R28
R12
C19
+
R13
SCR4
Q2
Q3
Q6
C2
+
C8
+
D5
T4
C15+
4
CD1
CD2
CN-14
CD3
CD4
1
CN-12
3
EL1-
EL1+
1
CN-7
5
T2+
T2-
XE1-
XE1+
1
CN-16
2
CE2
CE1
1
R34
C17
D14
BATT1+
L1
+
C1
LD2A1
LD2A2
LD2K
3
CN-10
1
CH1
CH2
CH4
CH3
5
CN-11
1


RQ1,14
C
E
B
RQ5,12,15
C
E
B

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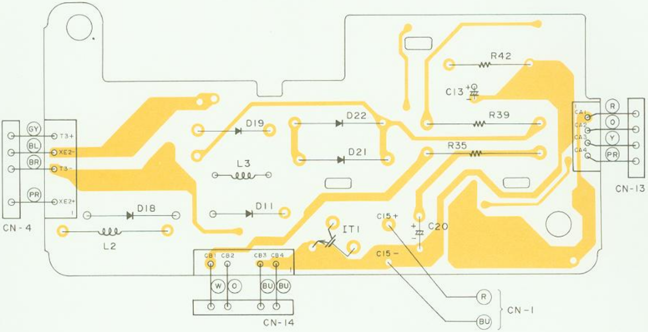
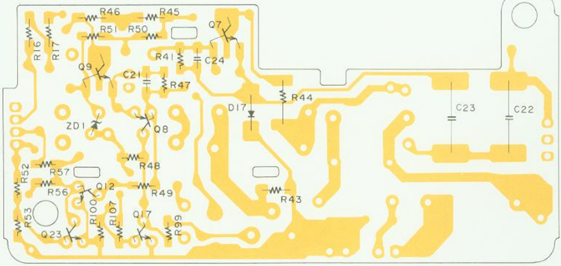
3-3. (D) CBA


GY
BL
BR
PR
T3+
XE2-
T3-
XE2+
1
CN-4
D18
L2
D19
L3
D11
D22
D21
IT1
C15+
C15-
C20
C13
R42
R39
R35
CA1
CA2
CA3
CA4
R
O
Y
PR
CN-13
CB1
CB2
CB3
CB4
W
O
BU
BU
CN-14
R
BU
CN-1


R46
R45
R16
R17
R51
R50
Q7
R41
C24
Q9
C21
R47
R44
D17
ZD1
Q8
C23
C22
R52
R57
R48
R56
Q12
R49
R43
R53
R100
R107
Q17
R99
Q23

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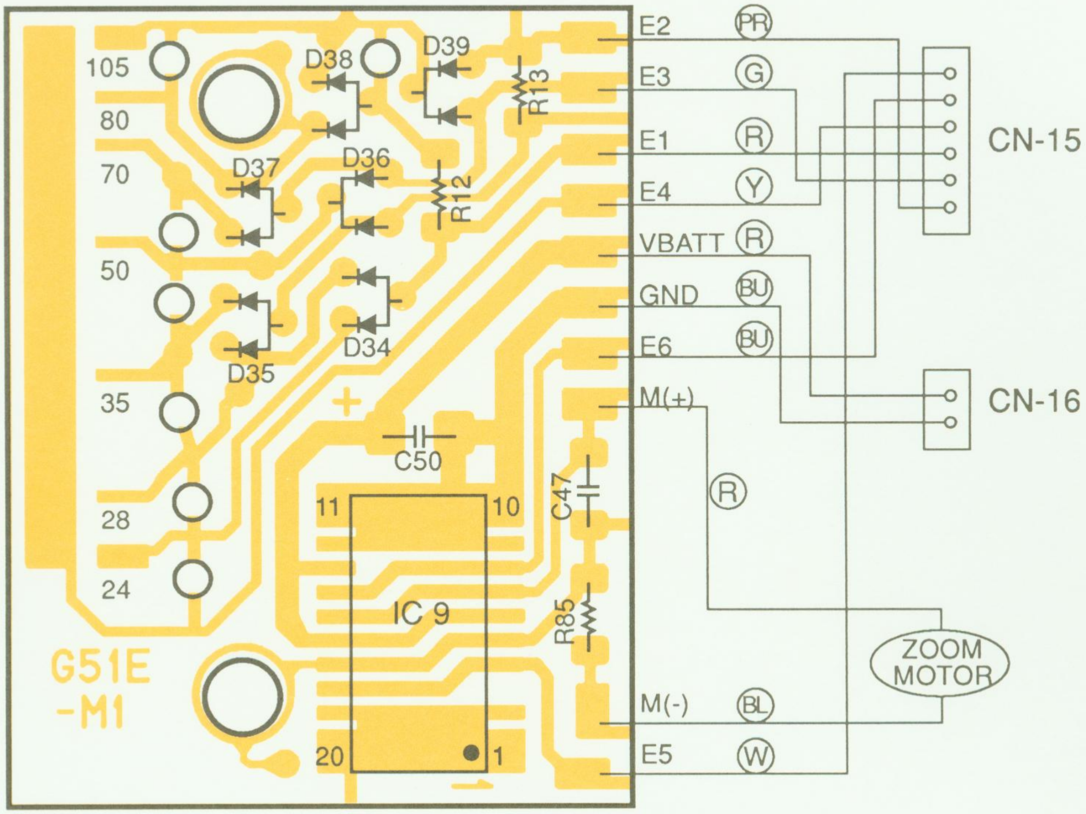
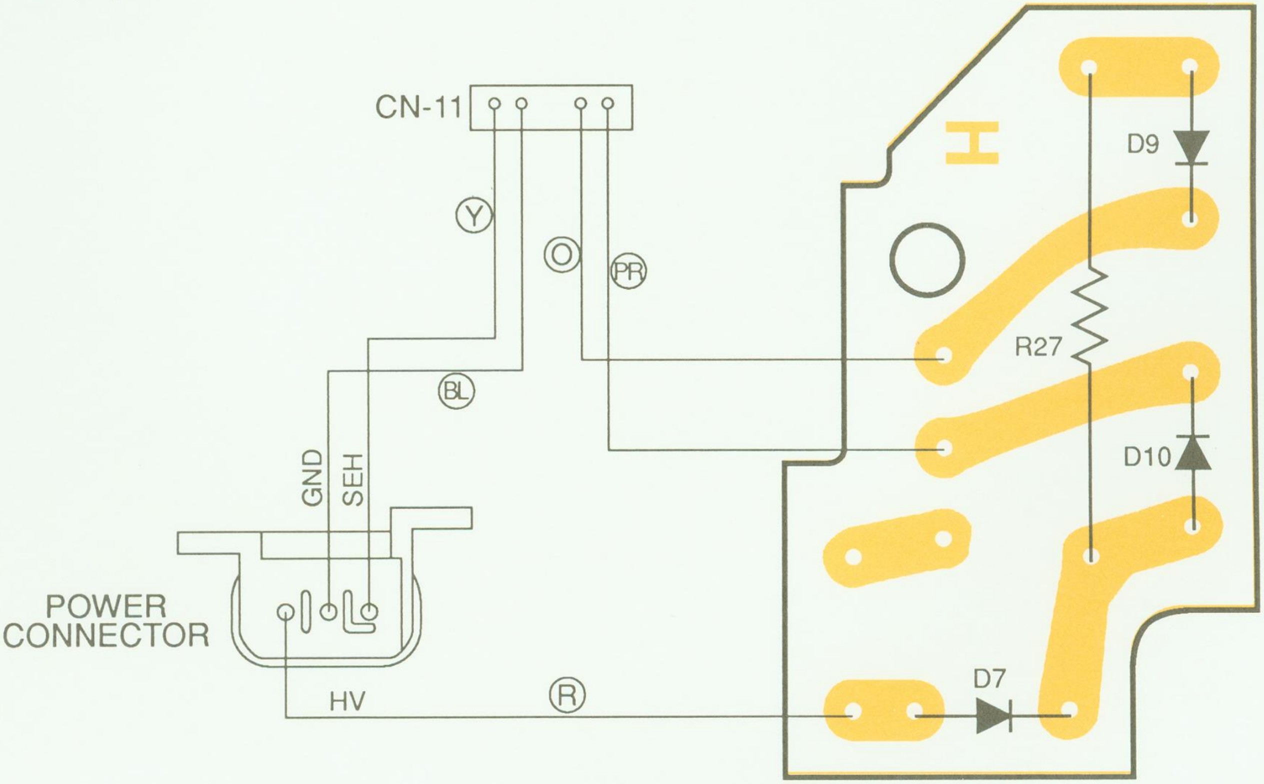
3-4. (E) CBA


105
80
70
50
35
28
24
D38
D39
D37
D36
D35
D34
R13
R12
C50
C47
R85
IC 9
11
10
20
1
G51E
-M1
E2
PR
E3
G
E1
R
E4
Y
VBATT
R
GND
BU
E6
BU
M(+)
R
M(-)
BL
E5
W
CN-15
CN-16
ZOOM
MOTOR

3-5. (H) CBA


CN-11
Y
O
PR
BL
GND
SEH
POWER
CONNECTOR
HV
R
H
D9
R27
D10
D7

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